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02-9008-15

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REV. NO. 0

FINAL DRAFT
SITE INSPECTION REPORT
LOCKWOOD FARMS

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-9008-15
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

, 1990

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY:

RICHARD FEINBERG
PROJECT MANAGER

~~DENISE O'DONOGHUE~~
SITE MANAGER

REVIEWED/APPROVED BY:

RONALD M. NAMAN
FIT OFFICE MANAGER

419399

John Hiltermann

Complete Mailing Address

13. Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Sources

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Aboveground tank containing oil;	
2	103 transformers, 7 with oil; oil from transformers dumped on the ground; estimated 200 gallons of transformer oil in drums.	

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

None known.

14. Information available from

Contact Amy Brochu Agency U.S. EPA Tel. No. (201) 906-6802

Preparer ________ Agency NUS Corp. Region 2 FIT Date ________

SITE INSPECTION REPORT: LEVEL (I, II OR III)

PART I: SITE INFORMATION

1. **Site Name/Alias** Lockwood Farms

Street Herkimer Road

City Schuyler **State** New York **Zip** 13340

2. **County** Herkimer County **County Code** 043 **Cong. Dist.** 26

3 **EPA ID No.** NYD980534622

4. **Block No.** 999.150-7 **Lot No.** 51.45

5. **Latitude** 43° 04' 22" N **Longitude** 75° 06' 27" W

USGS Quad. Ilion, New York

6. **Owner** Mr. John Lockwood **Tel. No.** (315) 732-8423 (315) 733-9898

Street 57 Buttonball Trailer Park

Herkimer Rd
Frankford NY

City Utica **State** New York **Zip** 13502

7. **Operator** Mr. John Lockwood **Tel. No.** (315) 732-8423

Street 57 Buttonball Trailer Park

City Utica **State** New York **Zip** 13502

8. **Type of Ownership**

- [x] Private
- [ ] Federal
- [ ] State
- [ ] County
- [ ] Municipal
- [ ] Unknown
- [ ] Other ______

9. **Owner/Operator Notification on File**

- [ ] RCRA 3001 Date ______
- [ ] CERCLA 103c Date ______
- [ ] None
- [ ] Unknown

10. **Permit Information**

Permit	Permit No.	Date Issued	Expiration Date	Comments

11. **Site Status**

- [ ] Active
- [ ] Inactive
- [x] Unknown

12. **Years of Operation** Unknown to Unknown

PART II: WASTE SOURCE INFORMATION

PART III: PRE-EXISTENT ANALYTICAL DATA

No Previous Analytical Data.

PART IV: SITE INSPECTION SAMPLE RESULTS

PART V: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

Ref. No.

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

In the vicinity of the site quaternary glacial and alluvial deposits serve as the aquifer of concern. The deposits are fine grained, but in places contain interstratified beds of coarser sand and gravel with some silt and clay. The quaternary deposits are overlain in the immediate vicinity of the site by colluvial fan deposits ranging in thickness form 1 to 5 meters. The depth and thickness of the quaternary deposits is unknown but is believed to range between 70 to 150 feet. The quaternary deposits are underlain by the Utica and Frankfort Shale formations which form the bedrock for the area. The permeability of the deposits is estimated to be 10^{-3} to 10^{-5} cm/sec. Based on the elevation of the Mohawk River located 300 feet south of the site, the depth to water table is estimated to be less than 20 feet. The direction of groundwater flow generally follows surface drainage patterns which flows east from the site.

Ref. Nos. 10, 11, 12, 13, 14

3. **Is a designated sole source aquifer within 3 miles of the site?**

There are no sole source aquifers within 3 miles of the site.

Ref. No. 1

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

The lowest point of waste disposal is assumed to be ground surface. The depth from the ground surface to the aquifer of concern is estimated to be less than 20 feet.

Ref. Nos. 19, 21, 22

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

The least permeable continuous intervening stratum between the ground surface and aquifer of concern is glacial sands and gravels, having a permeability value of 10^{-3} to 10^{-5} cm/sec.

Ref. Nos. 11, 12, 13, 14, 18

6. **What is the net precipitation for the area?**

The net precipitation for the area is 21 inches.

Ref. No. 18

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

   Groundwater is used as a private and municipal drinking source.

   Ref. Nos. 9, 15

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

   The distance to the nearest well currently used for drinking water is 300 feet. The depth of the well is approximately 20 feet deep.

   Ref. Nos. 9, 15, 19

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

   All residents in the area are on well water. The population served by the aquifer within a 3-mile radius of the site is greater than 4,300.

   Ref. Nos. 8, 9, 15

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

    Ref. No.

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

    The nearest downslope surface water is the State Barge Canal which concurs with the Mohawk River. The distance from the site to the canal is approximately 1,000 feet. The Mohawk River flows east past the towns of Mohawk and Herkimer. Railroad tracks exist between the site and the canal, causing difficulty in ascertaining drainage patters.

    Ref. Nos. 9, 21

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

    The average facility slope is less than 3 percent.

    Ref. Nos. 19, 21, 22

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

    The slope of the intervening terrain is less than 3 percent.

    Ref. Nos. 19, 21, 22

14. What is the 1-year 24-hour rainfall?

The 1-year 24-hour rainfall for the area is approximately 2.25 inches.

Ref. No. 18

15. What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.

The distance from the site to the nearest downslope surface water measured along the migration pathway is approximately 1,000 feet.

Ref. Nos. 19, 21

16. Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).

The Mohawk River is used for recreation (boating and fishing).

Ref. No. 3

17. Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.

There are no wetlands greater than 5 acres in area within 2 miles downstream of the site.

Ref. No. 21

18. Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.

There are no known critical habitats of federally listed endangered species within 2 miles of the site.

Ref. No. 4

19. What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?

There are no sensitive environments within 2 miles of the site.

Ref. Nos. 4, 21

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

There are no surface water intakes within 3 miles downstream of the site.

Ref. Nos. 6, 7

21. What is the state water quality classification of the water body of concern?

The state water quality classification of the Mohawk River is "B". The waters are suitable for primary contact recreation and any other uses except as a source for drinking water, culinary, or food processing purposes.

Ref. Nos. 2, 5

22. **Describe any apparent biota contamination that is attributable to the site.**

Ref. No.

AIR ROUTE

23. **Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

Ref. No.

24. **What is the population within a 4-mile radius of the site?**

The population within a 4-mile radius of the site is approximately 7,800.

Ref. No. 8

FIRE AND EXPLOSION

25. **Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.**

Ref. No.

26. **What is the population within a 2-mile radius of the hazardous substance(s) at the facility?**

The population within a 2-mile radius of the facility is approximately 360.

Ref. No. 8

DIRECT CONTACT/ON-SITE EXPOSURE

27. **Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.**

Ref. No.

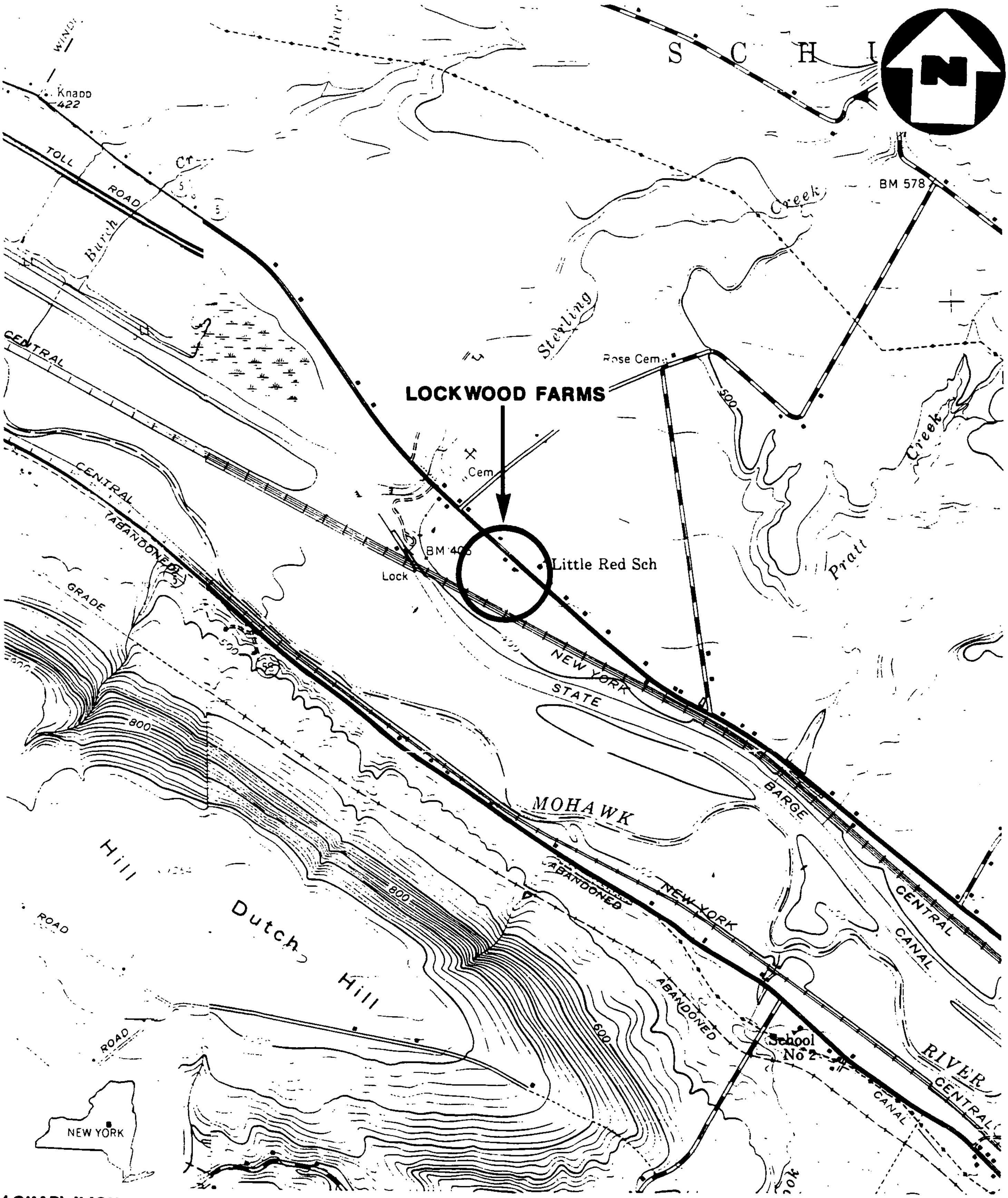
28. **How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?**

Ref. No.

29. **What is the population within a 1-mile radius of the site?**

The population within a 1-mile radius of the site is approximately 70.

Ref. No. 8



(QUAD) ILION, N.Y.

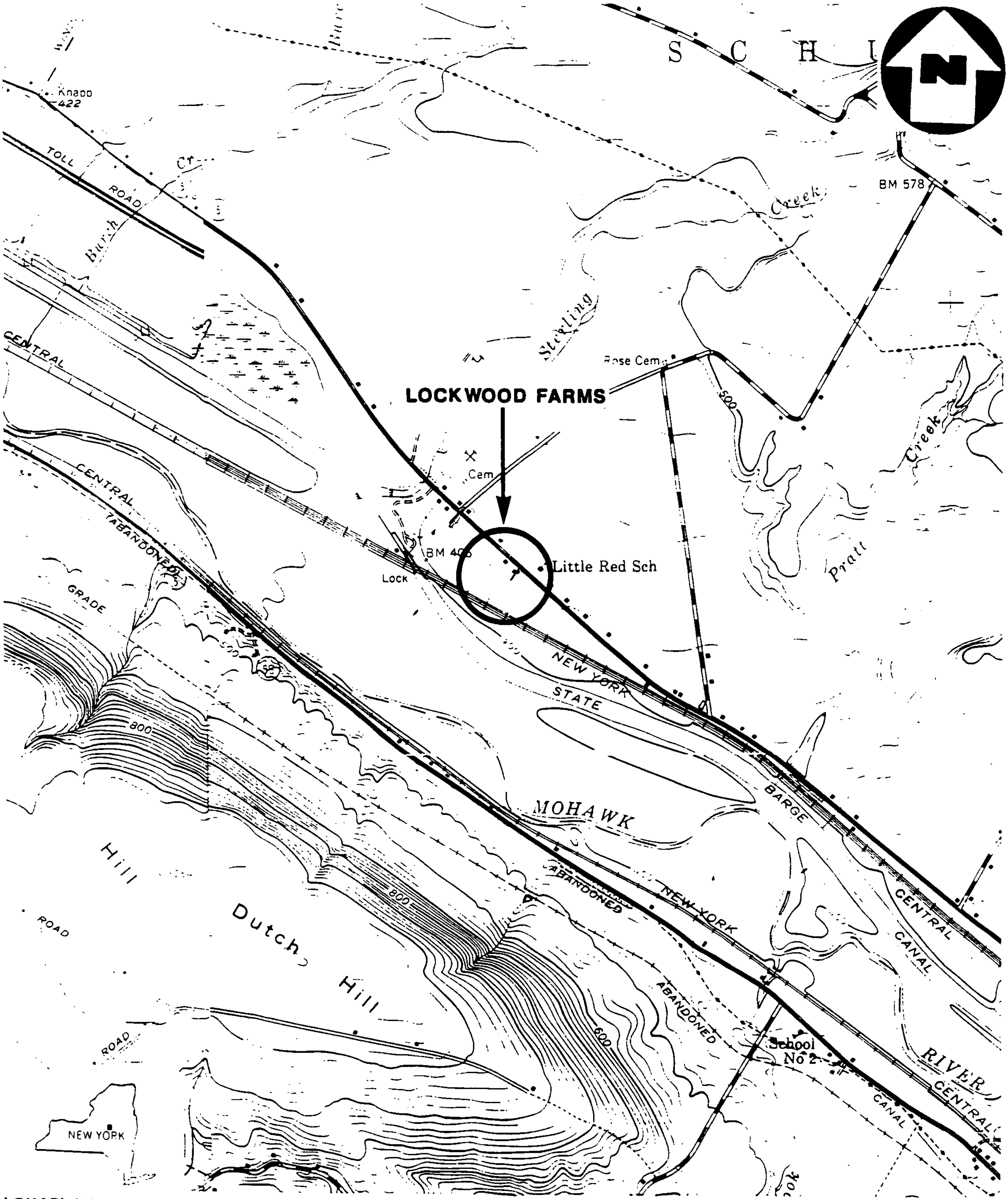
SITE LOCATION MAP

LOCKWOOD FARMS, SCHUYLER, N.Y.

SCALE: 1"= 2000'

FIGURE 1

NUS CORPORATION



(QUAD) ILION, N.Y.

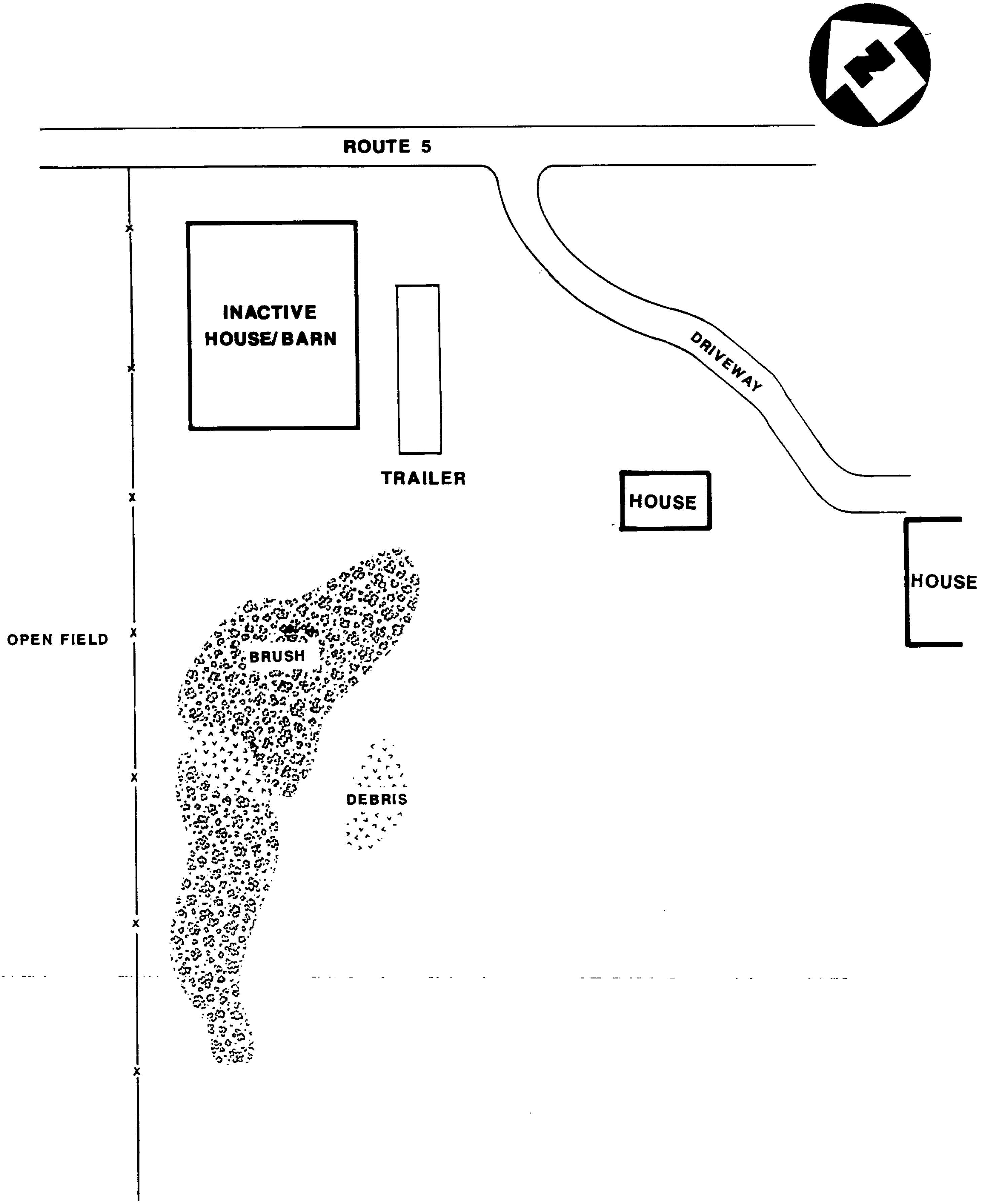
SITE LOCATION MAP

LOCKWOOD FARMS, SCHUYLER, N.Y.

SCALE: 1"= 2000'

FIGURE 1

NUS CORPORATION



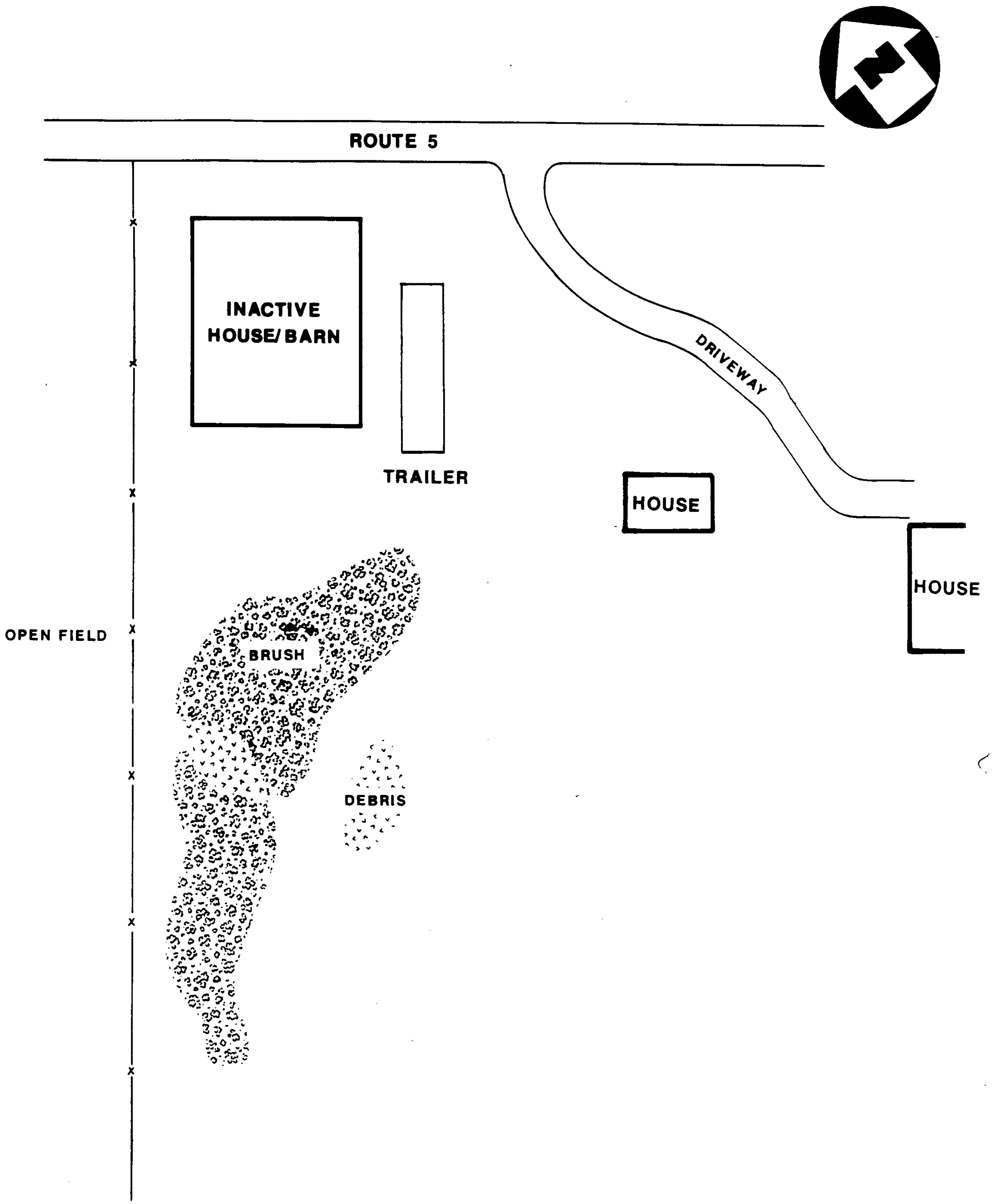
SITE MAP

LOCKWOOD FARMS, SCHUYLER, N.Y.

NOT TO SCALE

FIGURE 2

NUS CORPORATION



SITE MAP

LOCKWOOD FARMS, SCHUYLER, N.Y.

NOT TO SCALE

FIGURE 2

NUS CORPORATION

ATTACHMENT 1

ATTACHMENT 2

REFERENCES

1. Telecon Note: Conversation between Bill Kappel, USGS Ithica, New York,and Diane Trube, NUS Corporation, Region 2 FIT, December 15,1988.

2. Telecon Note: Conversation between Diane Dohn, Department of Environmental Conservation, Region 6, Utica, New York, and Denise O'Donoghue, NUS Corporation, Region 2 FIT, August 27, 1990.

3. Telecon Note: Conversation between Robert Cumm, Herkimer Village Water Office, Herkimer, New York, and Tom Varner, NUS Corporation, Region 2 FIT, June 26, 1987.

4. Significant Habitat Overlay, State of New York, Department of Environmental Conservation, Bureau of Wildlife, "Utica" Quadrangle, 1981, revised 1985.

5. New York State Department of Environmental Conservation, Surface Water and Groundwater Classifications, and Standards, New York State Codes, Rules and Regulations, Title 6, Chapter X, Parts 700-705, March 31, 1986.

6. Herkimer County Inventory Map, Wastewater Management Study Herkimer-Oneida County, no date available.

7. Telecon Note: Conversation between Frank Palumbo, Frankfort Water Department, and Paul Bauer, NUS Corporation, Region 2 FIT, June 25, 1990.

8. General Sciences Corporation, Graphical Exposure Modeling Systems (GEMS). Landover, Maryland 1986.

9. New York State Department of Health, Division of Environmental Protection, Bureau of Public Water Supply Protection, New York State Atlas of Community Water System Sources, 1982.

10. U.S. Department of Agriculture Soil Conservation Service. Soil Survey of Herkimer County, New York, Southern Part, May, 1975.

11. Cadwell, D., and Dineen, R., Surficial Geologic Map of New York, Hudson-Mohawk Sheet, 1987.

12. Halber, H.N., Hunt, O.P., and Pauszek, F.H., Water Resources of the Utica-Rome Area, New York, U.S. Department of the Interior, Geological Survey Water-Supply Paper 1499-C, Washington, U.S. Government Printing Office, 1962.

13. U.S. Department of Agriculture, Soil Conservation Service, General Soil Map, Herkimer County, New York, Southern Part, 1973.

14. The University of the State of New York, the State Education Department, Geological Map of New York, Hudson-Mohawk Sheet, compiled and edited by Donald W. Fisher, Yngvar W. Isachhson, Lawrence V. Richard, March 1970.

15. Telecon Note: Conversation between Frank Palumbo, Frankfort Water Department, and Paul Bauer, NUS Corporation, Region 2 FIT, August 23, 1990.

16. New York State Board of Elections, New York State Legislative Task Force on Demographic Research and Reapportionment, New York State Congressional Districts, 1984.

REFERENCES (Cont'd)

17. U.S. EPA Superfund Program, Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). p. 308, June 7, 1990.

18. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.

19. Letter from Mr. McCarthy, Syracuse Area Office, to Mr. Marsch, June 27, 1979.

20. Telecon Note: Conversation between Diane Vandawalker, Herkimer County Real Property Tax, and Denise O'Donoghue, NUS Corporation, Region 2 FIT, August 30, 1990.

21. Four-Mile Vicinity Map based on U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series, "Ilion, NY", 1943, "Utica East, NY" 1943, "Newport, NY", 1943, "South Trenton, NY", 1943.

22. Letter from Darrell Sweredoski, New York State Department of Environmental Conservation, for the record, June 22, 1979.

REFERENCE NO. 1

NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO:	DATE: 12/~~14~~ 15/88	TIME: 1435

DISTRIBUTION:
File J+J
02-881027

BETWEEN:	OF:	PHONE:
Bill Kappel	USGS Ithaca, NY	(607) 272 8722

AND:
Diane Trube

DISCUSSION:

Bill knows of no sole-source aquifers in Oneida or Herkimer Counties.

For other info on sole-source aquifers, call
John Malleck (EPA) (212) 264 5635
Fred Van Oldstein (NYDEC) 518 457 7458

ACTION ITEMS:

NUS 067 REVISED 0685

REFERENCE NO. 2

NUS CORPORATION AND SUBSIDIARIES | **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
02-9008-15	8/27/90	1040

DISTRIBUTION:

Lockwood Farms

BETWEEN:	OF:	PHONE:
Diane Dohm	Department of Environmental Conservation Region 6, Utica	(315) 793-2555

AND:

Denise O'Donoghue

DISCUSSION:

Diane stated that the Mohawk River in Schuyler, NY has a state water quality classification of B.

ACTION ITEMS:

REFERENCE NO. 3

CORPORATION

CONTROL NO. 02-8702-57

DATE: June 26, 1987

TIME: 1120

DISTRIBUTION: Library Bureau

BETWEEN: Mr. Robert Cumm

OF: Herkimer Village Water Office

PHONE: (315) 866-0150

AND: Tom VARNER

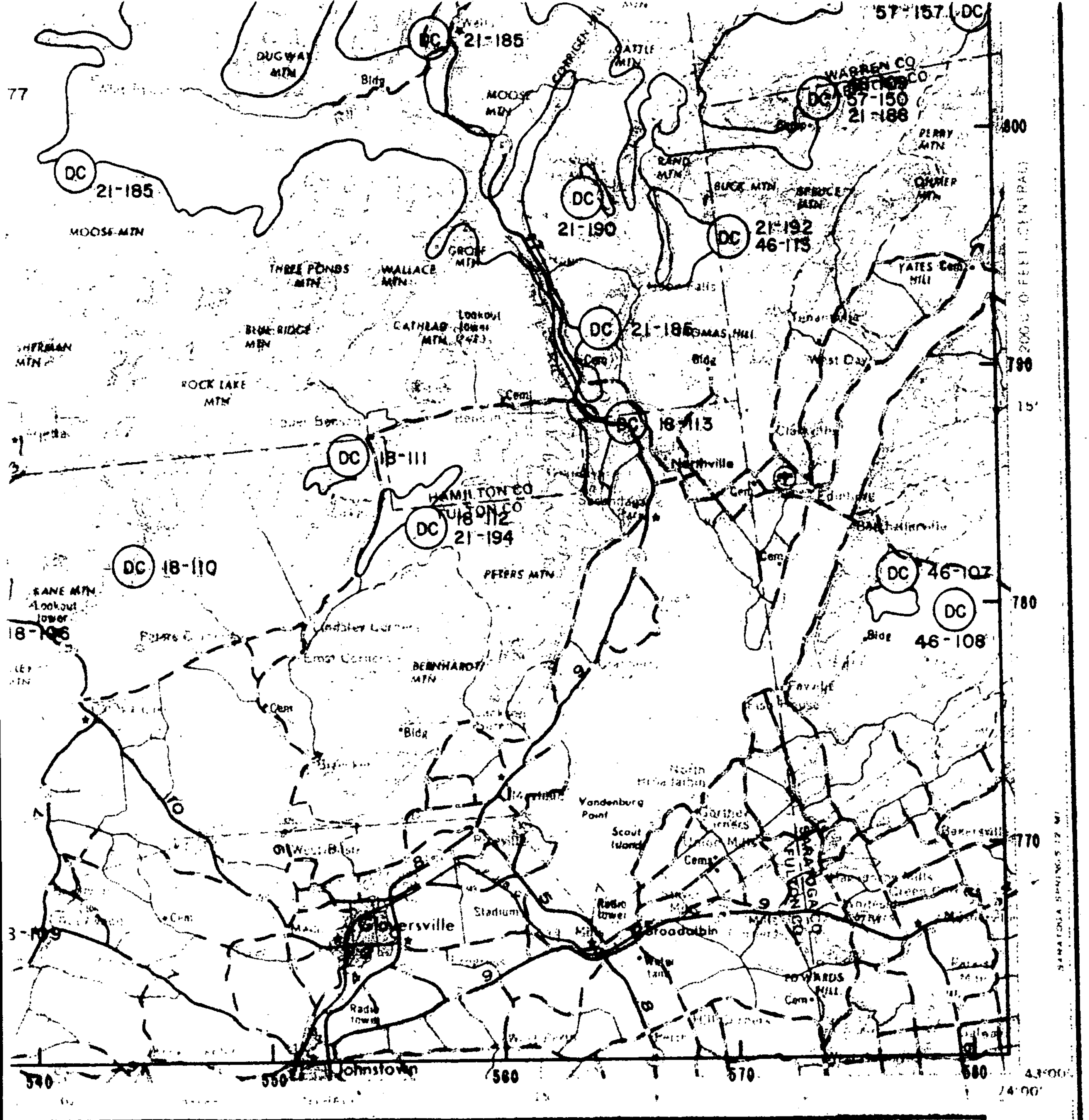
DISCUSSION:

Mr. Cumm said all drinking water is supplied by a reservoir 25 miles away. The ~~R~~ Mohawk River is used for Boating and Fishing. The WWTP receives Sanitary flow only, and is discharged to the Mohawk River. Storm drains in Herkimer Village empty into the Mohawk River

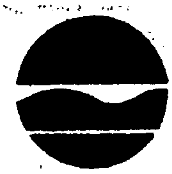
ACTION ITEMS:

NUS 087 REVISED 0581

REFERENCE NO. 4



SIGNIFICANT HABITAT OVERLAY NO. 2 OF 2



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF FISH AND WILDLIFE
BUREAU OF WILDLIFE

PREPARED FOR: SIGNIFICANT HABITAT UNIT
WILDLIFE RESOURCES CENTER
DELMAR, NEW YORK 12054
(518) 457-5782

PREPARED BY: HABITAT INVENTORY UNIT

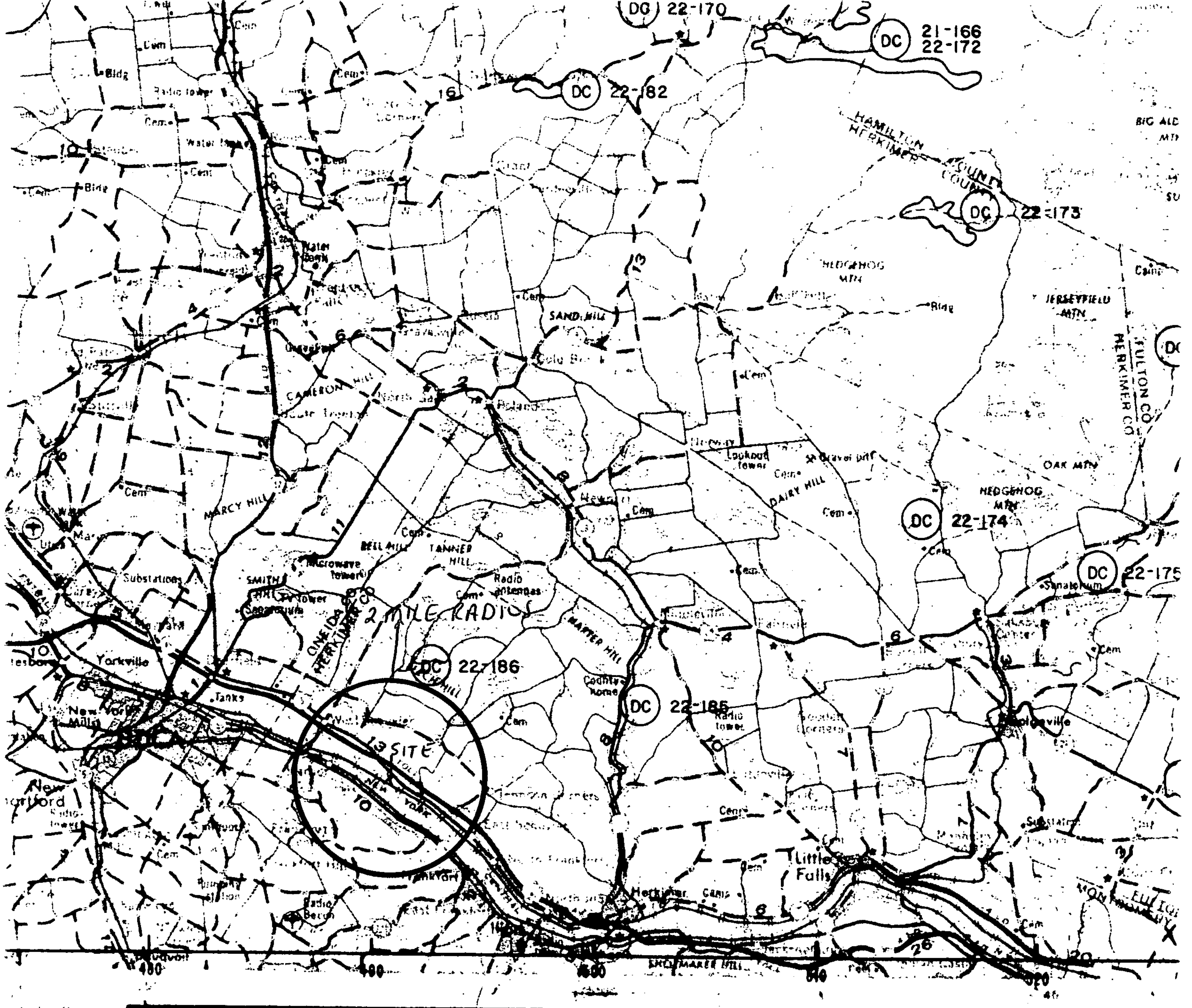
QUAD: UTICA

SCALE: 1:250,000

JANUARY, 1981

UTICA, NEW YORK

REVISED: 11/6/85



KEY

Scale 1:250,000

(DC) DEER CONCENTRATION AREA IN USE

(DN) DEER CONCENTRATION AREA NOT IN USE

(DA) DEER CONCENTRATION AREA AERIAL SURVEY

EXCLUDED AREA

REFERENCE NO. 5

WATER QUALITY REGULATIONS
SURFACE WATER AND GROUNDWATER CLASSIFICATIONS AND STANDARDS

New York State
Codes, Rules and Regulations
Title 6, Chapter X
Parts 700-705

New York State Department of Environmental Conservation

CLASS "B"

Best usage of waters. Primary contact recreation and any other uses except as a source of water supply for drinking, culinary or food processing purposes.

Quality Standards for Class "B" Waters

Items	*Specifications*
1. Coliform.	The monthly median coliform value for 100 ml of sample shall not exceed 2,400 from a minimum of five examinations, and provided that not more than 20 percent of the samples shall exceed a coliform value of 5,000 for 100 ml of sample and the monthly geometric mean fecal coliform value for 100 ml of sample shall not exceed 200 from a minimum of five examinations. This standard shall be met during all periods when disinfection is practiced.
2. pH	Shall be between 6.5 and 8.5.
3. Total dissolved solids.	None at concentrations which will be detrimental to the growth and propagation of aquatic life. Waters having present levels less than 500 milligrams per liter shall be kept below this limit.
4. Dissolved oxygen.	For cold waters suitable for trout spawning, the DO concentration shall not be less than 7.0 mg/l from other than natural conditions. For trout waters, the minimum daily average shall not be less than 6.0 mg/l. At no time shall the DO concentration be less than 5.0 mg/l. For non-trout waters, the minimum daily average shall not be less than 5.0 mg/l. At no time shall the DO concentration be less than 4.0 mg/l.

CLASS "C"

Best usage of waters. The waters are suitable for fishing and fish propagation. The water quality shall be suitable for primary and secondary contact recreation even though other factors may limit the use for that purpose.

Quality Standards for Class "C" Waters

Items	*Specifications*
1. Coliform.	The monthly median coliform value for 100 ml of sample shall not exceed 2,400 from a minimum of five examinations, and provided that not more than 20 percent of the samples shall exceed a coliform value of 5,000 for 100 ml of sample and the monthly geometric mean fecal coliform value for 100 ml of sample shall not exceed 200 from a minimum of five examinations. This standard shall be met during all periods when disinfection is practiced.
2. pH	Shall be between 6.5 and 8.5.

3. Total dissolved solids.	None at concentrations which will be detrimental to the growth and propagation of aquatic life. Waters having present levels less than 500 milligrams per liter shall be kept below this limit.
4. Dissolved oxygen.	For cold waters suitable for trout spawning, the DO concentration shall not be less than 7.0 mg/l from other than natural conditions. For trout waters, the minimum daily average shall not be less than 6.0 mg/l. At no time shall the DO concentration be less than 5.0 mg/l. For non-trout waters, the minimum daily average shall not be less than 5.0 mg/l. At no time shall the DO concentration be less than 4.0 mg/l.

CLASS "D"

Best usage of waters. The waters are suitable for fishing. The water quality shall be suitable for primary and secondary contact recreation even though other factors may limit the use for that purpose. Due to such natural conditions as intermittency of flow, water conditions not conducive to propagation of game fishery or stream bed conditions, the waters will not support fish propagation.

Conditions related to best usage of waters. The waters must be suitable for fish survival.

Quality Standards for Class "D" Waters

Items	*Specifications*
1. pH	Shall be between 6.0 and 9.5.
2. Dissolved oxygen.	Shall not be less than 3 milligrams per liter at any time.
3. Coliform.	The monthly median coliform value for 100 ml of sample shall not exceed 2,400 from a minimum of five examinations and provided that not more than 20 percent of the samples shall exceed a coliform value of 5,000 for 100 ml of sample and the monthly geometric mean fecal coliform value for 100 ml of sample shall not exceed 200 from a minimum of five examinations. This standard shall be met during all periods when disinfection is practiced.

Historical Note

Sec. added by renum. and amd. 701.4, filed July 3, 1985; amd. filed Sept. 20, 1985 eff. 30 days after filing.

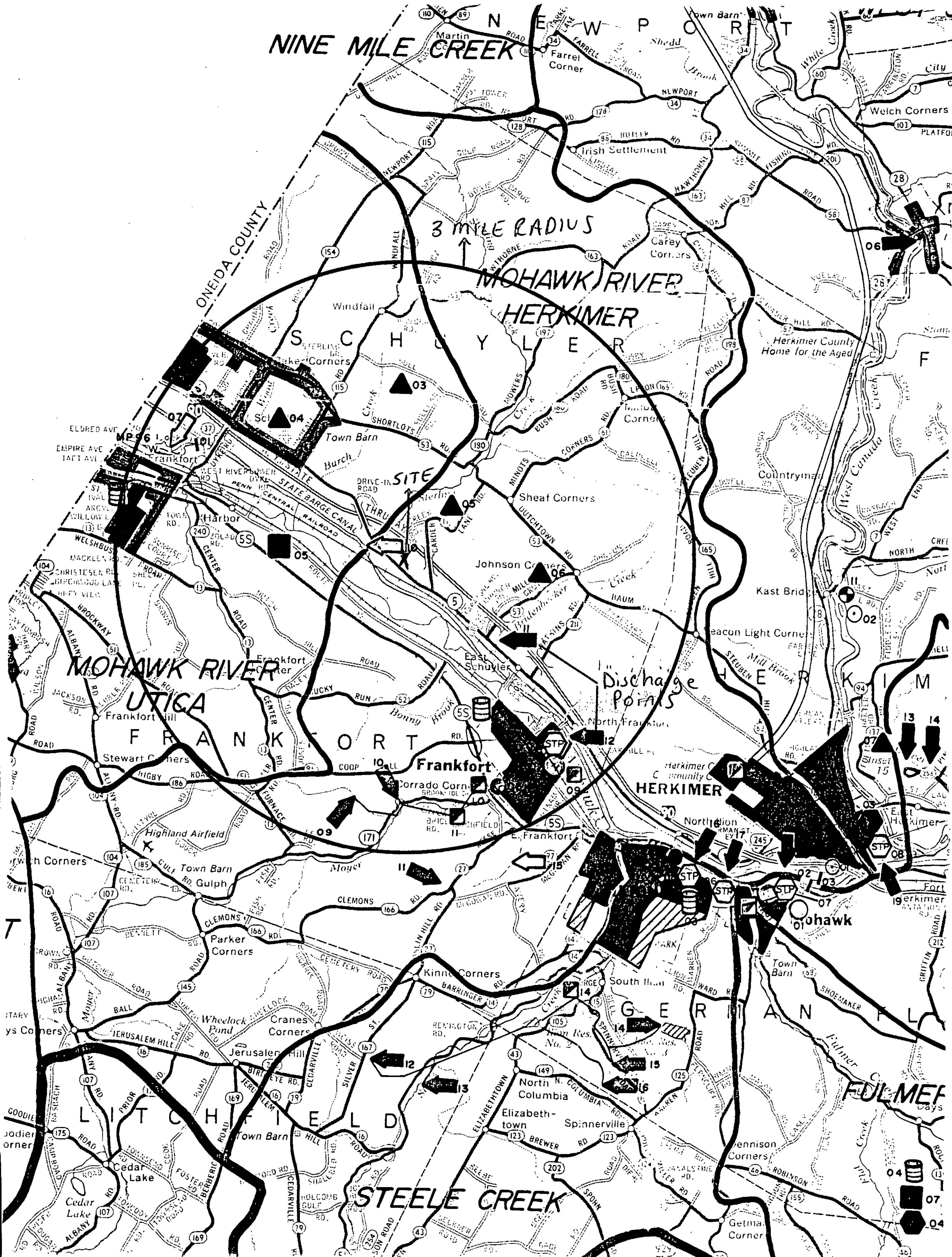
701.20 Classes and standards for saline surface waters. The following items and specifications shall be the standards applicable to all New York saline surface waters which are assigned the classification of SA, SB, SC or SD, in addition to the specific standards which are found in this section under the heading of each such classification.

REFERENCE NO. 6

02-8603-05/NYJS

VASTEWATER MANAGEMENT STUDY HERKIMER-ONEIDA CC

HERKIMER COUNTY INVENTORY MAP



NINE MILE CREEK
3 MILE RADIUS
MOHAWK RIVER
HERKIMER
SITE
Dischage Points
MOHAWK RIVER
UTICA
STEELE CREEK
FULMER
ONEIDA COUNTY
SCHUYLER
FRANKFORT
HERKIMER
LITCHFIELD
GERMAN FLATS
NEWPORT
Frankfort
Mohawk
Windfall
Baker Corners
Town Barn
Sheaf Corners
Johnson Corners
East Schuyler
North Frankfort
Corrado Corners
E. Frankfort
Frankfort Center
Frankfort Hill
Stewart Corners
Highland Airfield
Gulph
Parker Corners
Kinne Corners
Cranes Corners
Jerusalem Hill
Cedar Lake
North Columbia
Elizabethtown
Spinnerville
South Ilion
Getman Corner
Dennison Corners
North Ilion
Herkimer County Home for the Aged
Countryman
Kast Bridge
Beacon Light Corners
Carey Corners
Irish Settlement
Martin
Farrel Corner
Welch Corners
Harbor
STATE BARGE CANAL
PENN CENTRAL RAILROAD
THRUWAY
Wheelock Pond
Ilion Res. No. 2

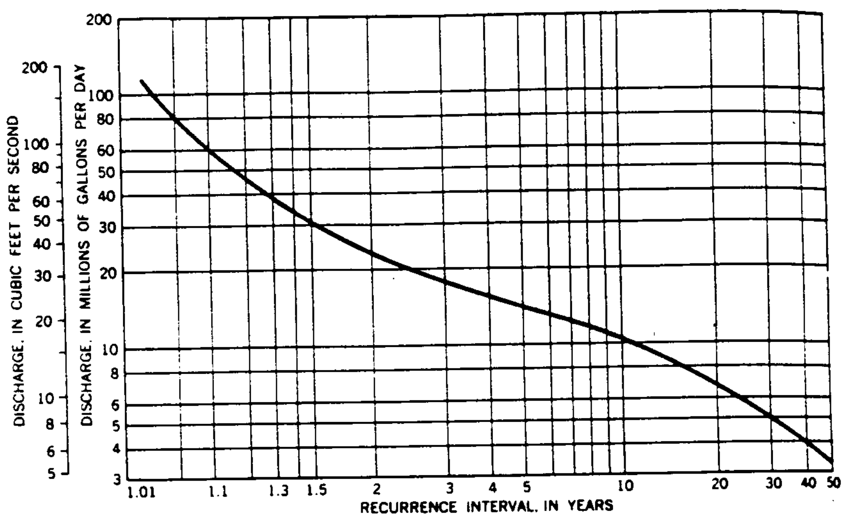


FIGURE 9.—Magnitude and frequency of observed annual consecutive 7-day low flows, East Branch Fish Creek at Taberg, 1923–58.

and Sauquoit Creeks. It is available in small supply from the bedrock formations and from the veneer of ground moraine overlying the bedrock in the upland areas, although it may be hard. Ground water also serves to maintain the low-water flow of the streams and conversely may be recharged by adjacent streams during floods or periods of heavy ground-water pumpage.

MOHAWK RIVER LOWLAND

The Mohawk River lowland as described in this report is the area within the Mohawk River valley that is underlain by glaciofluvial deposits and by lacustrine and alluvial deposits (pl. 1). The land surface is mainly valley bottom or flood plain and adjacent terraces. It is nearly level and has a maximum relief of about 200 feet, the outer limit of the lowland being at an altitude of about 600 feet. Within the lowland, moderate to large quantities of ground water can be obtained from sand and gravel deposits (table 5). These deposits make up the greater part of the unconsolidated material underlying the extensive sand plain north of Rome, the valley of Ninemile Creek below Holland Patent, and the terraces bordering the Mohawk River plain from west of Rome to Frankfort. They also are interspersed with extensive beds of clay and silt in the fill of the Mohawk River plain.

Data upon which to base reliable appraisals of yield of ground water are lacking for this area because many wells for which records are available were drilled for domestic users requiring only small supplies and the wells were not constructed or developed for maximum yield.

TABLE 5.—*Geologic formations in the Utica-Rome area and their water-bearing properties (modified from Dale, 1953 and Kay, 1953)*

Age: System	Age: Series	Geologic unit	Thickness (feet)	Average depth of wells (feet)	Range in yield of wells (gpm)	Average yield of wells (gpm)	Character of material and water-bearing properties
Quaternary	Recent and Pleistocene	Fine-grained glaciofluvial, lacustrine and alluvial deposits	70–150	68	2–40	11	Clay, silt, and sand formed in temporary lakes or by recent streams. Poor aquifer generally, but sand beds may yield moderate supplies, especially where recharged by nearby streams.
	Pleistocene	Medium to coarse-grained glaciofluvial and deltaic deposits	10–140	67	10–290	80	Interbedded and interlensing sand and gravel formed by sorting action of glacial melt water. Most productive aquifer in area, especially where recharged by nearby streams. Furnishes good-quality water, suitable for most purposes.
		Ground moraine (till)	1–40	10	1/2–10	3	Heterogeneous mixture ranging in grain size from clay to boulders. Found mostly in the uplands. Poor aquifer but furnishes enough water from dug wells for domestic use.
Silurian	Cayuga	Manlius limestone	150+	----	----	----	Dark blue fossiliferous limestone having dark shale partings. Furnishes small to moderate quantities of moderately hard water.
		Salina group: Bertie limestone	30	100	0–40	7	Drab-colored, thin-bedded, clayey limestone. Furnishes small to moderate quantities of moderately hard water.
		Salina group: Camillus shale	200 300				Mottled red and green, drab-colored shale and thin-bedded limestone zones. Yields sufficient water for domestic use but quality is very poor.
		Salina group: Vernon shale	300				Purplish-red shale spotted with green, and thin beds of green shale and limestone. Yields sufficient water for domestic use but quality is very poor.
	Niagara	Lockport dolomite	80	86	0–8	2¾	Dark-colored nearly black dolomite and shale. Furnishes small quantities of poor-quality water.
		Clinton group	270	67	½–35	9½	Green and gray shale and sandstone, a few dolomite and conglomerate beds, and several thin beds of fossiliferous red oolitic hematite (iron ore). Yields sufficient water for domestic purposes. Water may be hard in some places.
		Oneida conglomerate	29	----	----	----	Quartz-pebble conglomerate and crossbedded sandstone, pyritiferous. Relatively unimportant aquifer owing to thinness.
Ordovician	Upper Ordovician	Frankfort shale (includes Pulaski shale)	400–500	114	½–20	5	Gray sandy shale, thin beds of dolomite and calcareous sandstone. Furnishes small to moderate quantities of good-quality water.
		Utica shale	300–400	127	½–48	7½	Black and gray carbonaceous shale containing calcareous argillites. Reliable source of small to moderate quantities of water. Water obtained from openings along joints and bedding planes. Water is of good quality but contains hydrogen sulfide in some places.

From the available data it would seem that the most important potential sources of ground water in the area are the deposits of sand and gravel underlying the extensive plain between Rome and Delta Reservoir. These sediments were carried southward into the area by glacial melt water and were probably deposited in several stages, partly as glaciofluvial terraces and partly as a delta of the glacial Mohawk River. The deposits are coarse grained to the north near Delta Reservoir and become finer grained southward. They are generally less than 40 feet thick except in the vicinity of a buried bedrock channel that extends southwestward from the southwestern part of Delta Reservoir, in which they reach a maximum known thickness of 90 feet. They are a potentially productive source of ground water because they are highly permeable and are saturated for most of their thickness. Water levels in wells tapping sand and gravel deposits in the plain north of Rome are commonly 10 to 30 feet below the land surface. Maximum sustained yields from the glaciofluvial deposits in this area are not known as they are tapped only by domestic wells, except for an 8-inch-diameter screened well at the State Fish Hatchery north of Rome that is reported to have yielded 290 gpm with a drawdown in water level of 13 feet. Yields of about the same magnitude or even greater can probably be obtained from properly constructed wells elsewhere in the plain north of Rome.

The fill underlying the Mohawk River plain between Rome and Frankfort is the second most important source of ground water in the lowland. It occupies an older channel that was eroded deeply into the soft shales of the region. The maximum thickness of the valley fill ranges from about 70 feet at Rome to 150 feet at Frankfort. The deposits are thickest over the axis of the older eroded bedrock channel which seems to be south of the present river in the reach between Rome and Whitesboro and north of the Erie (Barge) Canal in the reach between Whitesboro and Frankfort. The sediments making up most of the valley fill were carried in by glacial melt water and deposited in the standing water bodies that were earlier glacial stages of the development of the Great Lakes. These are overlain generally by a veneer of flood-plain deposits of the present Mohawk River. Consequently the sediments are predominantly fine sand, silt, and clay, but they are interstratified in places with beds and lenses of coarser sand and gravel that were washed in by stronger currents (pl. 3). These water-bearing sand and gravel deposits yield moderate supplies to a few industrial and domestic wells and are potential sources of additional supplies. The yields of 9 wells between Rome and Frankfort penetrating sand and gravel ranged from 7 to 80 gpm.

wells receiving water by infiltration from Oriskany and Sauquoit Creeks may be similar to that of water from the creeks. In addition, water from these wells may be adversely contaminated by industrial wastes in the stream water, particularly wells in the lower reaches of the creeks where contamination of the water is greatest.

OTHER SOURCES

The ground moraine and isolated bodies of sand and gravel that are the surficial deposits outside the areas discussed previously and the consolidated bedrock which underlies the entire Utica-Rome area are also sources of ground water.

Most of the uplands above an altitude of about 600 feet in the Utica-Rome area are covered by a mantle of ground moraine and small isolated bodies of sand and gravel. In the lowlands ground moraine occurs beneath the stratified deposits. The ground moraine is mostly till, a direct deposit of the glacial ice consisting generally of a clay matrix containing sand and boulders. The till in this area is tough and compact and is often called hardpan by well drillers and farmers. It commonly has a very low permeability. Owing to its low permeability, till generally yields less than 1 gpm to wells but is an important source of water in quantities adequate for homes and small farms. Probably the maximum yield that can be obtained from a well tapping till is between 200 and 2,000 gpd. The water is commonly obtained by means of large-diameter dug wells which provide large infiltration area and storage capacity.

Supplies adequate for the needs of rural homes, small municipalities, and industries requiring only small quantities of water may be obtained from some of the small bodies of sand and gravel that overlie the till in the gently sloping parts of the upland areas. Ordinarily this sand and gravel mantle is a recent deposit of streams draining the upland. Although thin and of small areal extent, the sand and gravel bodies may yield small to moderate amounts of water to shallow wells of proper construction, especially where they are adjacent to streams. One of two wells of the Westmoreland Water District finished in these sand and gravel bodies was pumped at the rate of 380 gpm, the other at 194 gpm. The specific capacities of the wells were 69 and 16 gpm per foot, respectively.

Where exposed, the bedrock consists of sedimentary rock formations composed principally of shale, sandstone, limestone, and dolomite. As described in table 5, they include the Utica and Frankfort shales, the Clinton group containing the red iron ores, the Lockport dolomite, the Vernon and Camillus shales, and the Bertie and Manlius limestones. The well-known Utica and Frankfort shales

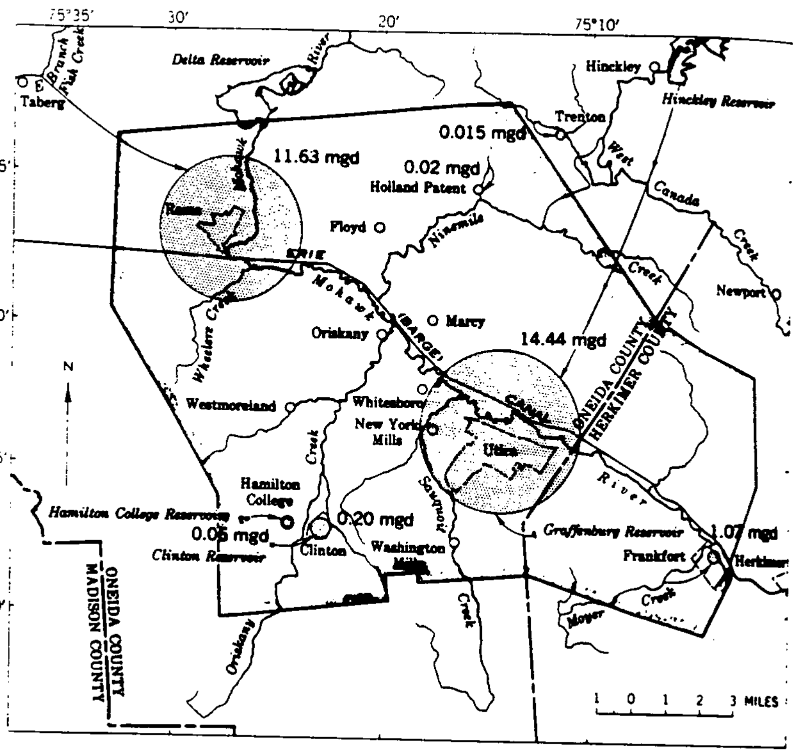


Figure 11.—Source of and demand on the public water supplies.

Reservoir, constructed by the State in 1915 as a feeder reservoir for the Erie (Barge) Canal, has a capacity of 25,000 million gallons; and Graffenburg Reservoir, built in 1854, has a capacity of 654 million gallons. About 98 percent of the demand is obtained from Hinckley Reservoir, the city of Utica having the right to divert about 50 mgd. In addition to supplying the city, the water-supply system furnishes water to the villages of New Hartford, New York Mills, Oriskany, Whitesboro, and Yorkville and to suburban customers in the towns of Deerfield, Frankfort, Marcy, New Hartford, Schuyler, Trenton, and Whitestown.

The water from Hinckley and Graffenburg Reservoirs has the lowest mineral content and is the softest water (19 ppm, hardness as $CaCO_3$) of any of the public supplies in the area (fig. 12 and table 8).

Rome takes its entire supply from East Branch Fish Creek in the Oneida River basin. The maximum daily use in 1954 was 17.8 million gallons of which slightly less than half was used by industry. The present rated capacity of the system is 21 mgd, and it is being

More than half the water for livestock and domestic use on farms is drawn from springs; the remainder is obtained from wells. Farm ponds supply a small part of the water used for watering stock.

POSSIBILITY OF FURTHER DEVELOPMENT

Ample supplies of water are available in most of the Utica-Rome area for all uses. The Utica municipal supply is capable of furnishing much more water to current or potential users than is presently demanded, by virtue of its right to divert 50 mgd from Hinckley Reservoir. The present demand upon the public supply of the city of Rome is near the rated capacity of the present system, which is being enlarged.

The area can be supplied with much more surface water. The Mohawk River and the Erie (Barge) Canal and its two feeders near the area, Delta and Hinckley Reservoirs, are the major sources. The larger tributaries of the Mohawk River within the area, Oriskany and Sauquoit Creeks, can supply moderate quantities of water.

Ground water is available in moderate quantities from extensive deposits of sand and gravel along the main river channels or in a few buried valleys. This is true especially if the bodies of coarse-grained materials are in a position to be recharged with surface water.

The quality of the surface water is generally fair. Ground water from the unconsolidated deposits is generally of good quality and can be used for most purposes with little treatment.

MOHAWK RIVER LOWLAND

The Mohawk River is a source of water for large potential development. The present withdrawal from the Mohawk River and Erie (Barge) Canal is only a small part of the flow, and much of the water withdrawn is not consumed. The flow below Delta Dam, where the river enters the area, equals or exceeds 108 mgd 90 percent of the time; and the flow at Little Falls, about 10 miles east of the point where the river leaves the Utica-Rome area, equals or exceeds 560 mgd 90 percent of the time. The quality of the water is fair and is probably satisfactory for most uses or can be made satisfactory by suitable treatment. The Mohawk River is an important potential source of water for industrial, agricultural, and fire-fighting uses in its present condition. The impounded water in Delta Reservoir and the water in the Mohawk River are potential sources for municipal supply if treated.

The valley fill of the Mohawk River lowland includes many bodies of coarse-grained sand and gravel that are potential sources of ground water. The water generally is of good quality and is suitable for most uses without treatment. The most favorable areas of potential development are the extensive plains between Rome and Delta Reservoir, the flood plain of the Mohawk River between Rome and Frankfort, and the valley lowland of Ninemile Creek below Holland Patent. Deposits of sand and gravel underlying the northern part of the plain between Rome and Delta Reservoir are a potentially productive source of moderate supplies of ground water because they are highly permeable and are saturated for most of their thickness. Available test data indicate that yields of about 300 gpm or larger can be obtained. The valley fill underlying the flood plain of the Mohawk River is mostly fine sand, clay, and silt; however in some places these fine-grained materials are interstratified with sand and gravel. Drill data and information from a few industrial wells indicate that wells yielding as much as 500 gpm can be developed at sites where the sand and gravel aquifers are hydraulically connected with the river. Where the aquifers are not connected with the river, wells are likely to yield 80 gpm or less. The sand and gravel deposits in Ninemile Creek valley are a potentially productive source because they are thick and saturated throughout much of their thickness. Maximum sustained yields are not indicated from existing data. The most favorable area of potential development in Ninemile Creek valley is along the axis of a buried bedrock channel southwest of Floyd and north of the present creek.

OTHER POTENTIAL SOURCES

Several creeks and smaller streams tributary to the Mohawk River and draining the upland areas of the valley in the Utica-Rome area have well-sustained low flows and are important sources for potential development. Oriskany and Sauquoit Creeks are examples of such streams. Miscellaneous flow measurements on Sauquoit Creek, for example, show that the creek has a probable flow that equals or exceeds 0.33 mgd per square mile 90 percent of the time. The mineral content of water in streams draining the south slopes of the Mohawk valley is high and may require treatment before it can be used by industries and municipalities.

Coarse-grained sand and gravel deposits adjacent to the smaller streams may yield small to moderate quantities of water. These deposits are much smaller than those in the Mohawk River lowland, but where they are hydraulically connected with adjacent streams, they may yield dependable supplies. Industrial wells tapping sand and gravel deposits in the Oriskany and Sauquoit Creek valleys have yielded from 64 to 170 gpm. The water from these wells probably has a high content of dissolved solids.

The public water-supply may be the most satisfactory source of water for industrial use in the Utica-Rome area. The cities of Utica

REFERENCE NO. 13

N

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

HERKIMER COUNTY, NEW YORK, SOUTHERN PART

Scale 1:126,720

1 0 1 2 3 4 Miles

DEE

Mosh
drain

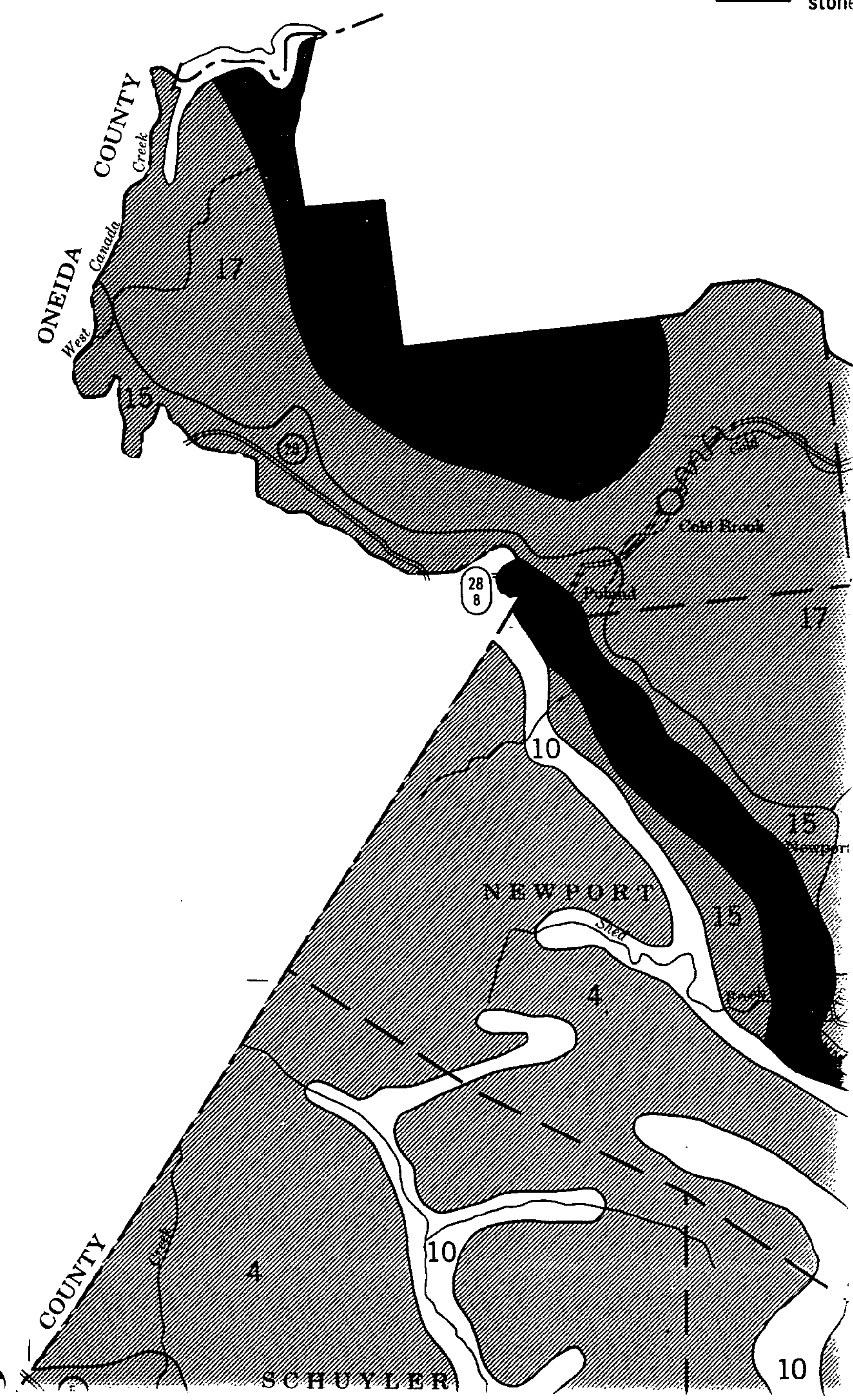
Broa
medi
soils

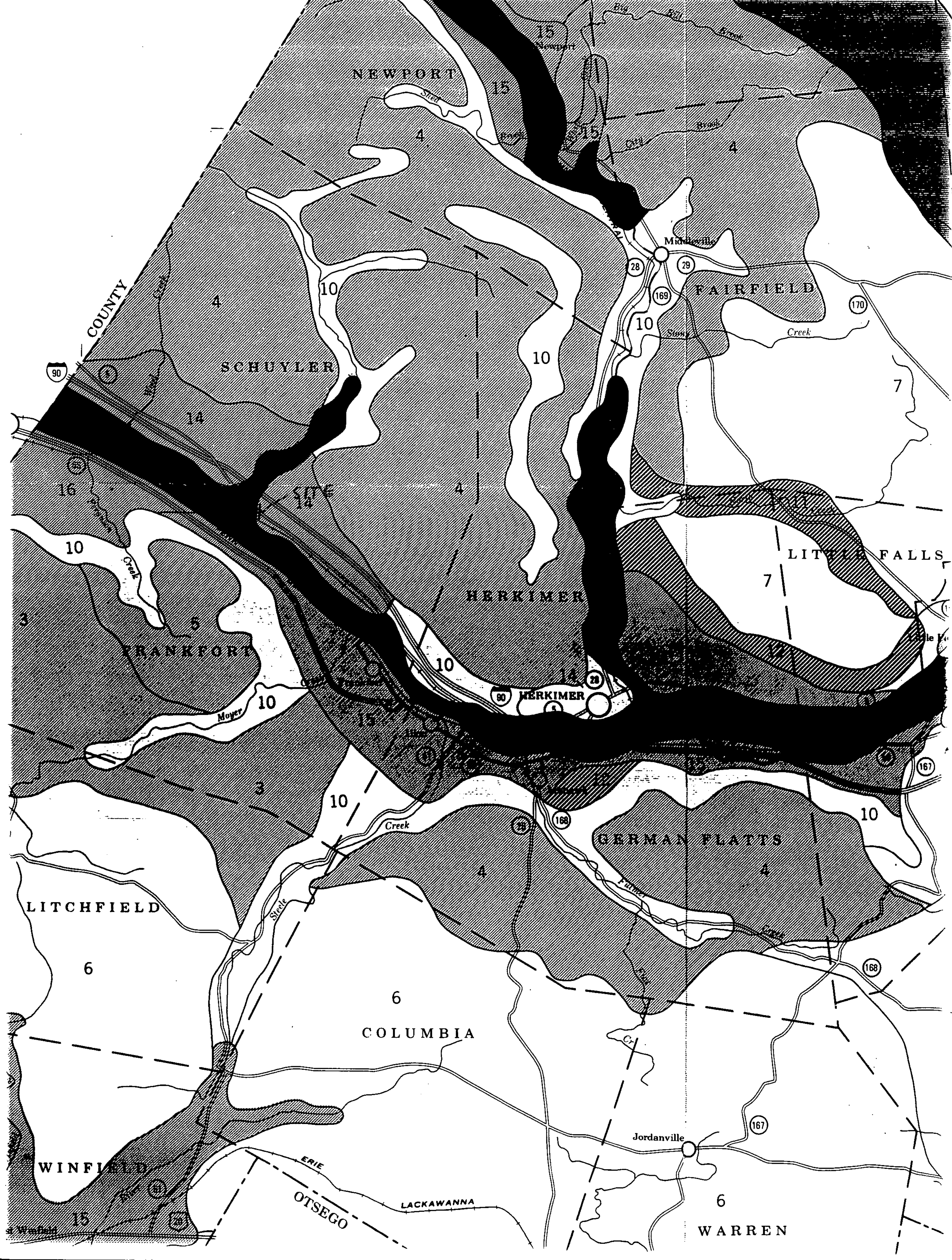
D

3 Hilto
drain

4 Manh
textu
drain

5 Appl
drain
stone





NEWPORT
Newport
Big
Brook
15
4
Middleville
28
29
169
170
FAIRFIELD
10
Stony
Creek
7
COUNTY
90
SCHUYLER
14
16
3
5
FRANKFORT
Moyer
Creek
HERKIMER
HERKIMER
LITTLE FALLS
12
167
168
GERMAN FLATTS
6
LITCHFIELD
Steele
COLUMBIA
Jordanville
WARREN
WINFIELD
ERIE
LACKAWANNA
OTSEGO
20

SOIL ASSOCIATIONS *

.D IN NONCALCAREOUS GLACIAL TILL; ON UPLANDS

in association: Deep, somewhat poorly drained to well-
ıred soils that have a fragipan

·sociation: Deep, well drained and moderately well drained,
; that have a fragipan, and well-drained, medium-textured
rse-textured substratum

:MED IN CALCAREOUS GLACIAL TILL; ON UPLANDS

rio association: Deep, well drained to somewhat poorly
ıred soils formed in glacial till from sandstone and limestone

nsing association: Deep, somewhat poorly drained, medium-
in glacial till from alkaline shale, and moderately well
ned soils formed in till from shale, siltstone, and limestone

nesus association: Deep, somewhat poorly drained to well-
ıred soils formed in glacial till from shale, siltstone, sand-

DEEP TO SHALLOW SOILS FORMED IN CALCAREOUS AND NONCALCAREOUS GLACIAL TILL; ON UPLANDS

6 Honeoye-Wassaic-Farmington association: Deep to shallow, well-drained, medium-textured soils formed in glacial till from limestone and siltstone

7 Mohawk-Manheim association: Deep, well-drained to somewhat poorly drained, medium-textured soils formed in glacial till from alkaline shale

8 Lansing-Hornell-Manlius association: Deep, well-drained, medium-textured soils formed in glacial till from shale, siltstone, and limestone, and moderately deep, somewhat poorly drained to excessively drained, medium-textured soils formed in till from acid shale

9 Mohawk-Manlius-Hornell association: Deep, well drained and moderately well drained, medium-textured soils that formed in glacial till from alkaline shale, and moderately deep, excessively drained to somewhat poorly drained, medium-textured soils formed in till from acid shale

10 Rough broken land-Shaly rock land association: Deep to very shallow, steep and very steep land

DEEP SOILS FORMED IN CALCAREOUS GLACIAL TILL AND IN GLACIOLACUSTRINE SEDIMENT OVER LOAMY GLACIAL TILL OR OUTWASH; ON UPLAND-LAKE PLAIN FRINGE AREAS

11 Hudson-Rhinebeck association: Deep, moderately well drained to somewhat poorly drained, medium-textured soils formed in lacustrine sediment over loamy glacial till or outwash

12 Mohawk-Manheim-Rhinebeck association: Deep, well-drained to somewhat poorly drained, medium-textured soils formed in glacial till from alkaline shale, and somewhat poorly drained, medium-textured soils formed in lacustrine sediment over loamy glacial till or outwash

DEEP SOILS FORMED IN RECENT ALLUVIUM; ON FLOOD PLAINS

Alluvial land-Hamlin-Teel association: Deep, excessively drained to very poorly drained soils of variable texture that formed in recent alluvium

SOILS FORMED IN DEEP DEPOSITS; ON GLACIAL OUTWASH TERRACES, KAMES DELTAS, AND OLD ALLUVIAL FANS

14 Herkimer association: Deep, well drained and moderately well drained, medium-textured soils formed in water-sorted deposits rich in dark, alkaline shale

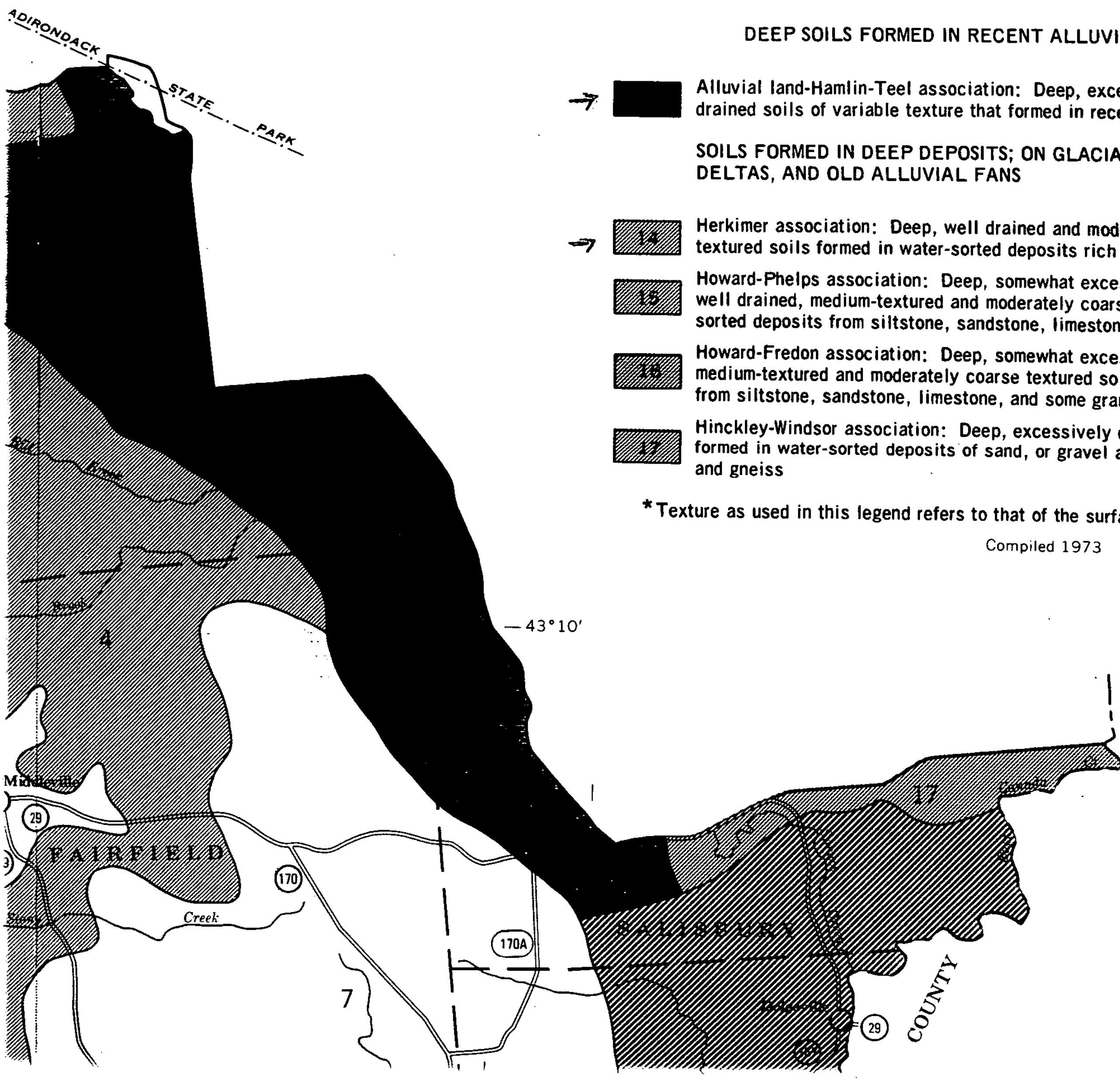
15 Howard-Phelps association: Deep, somewhat excessively drained to moderately well drained, medium-textured and moderately coarse textured soils formed in water-sorted deposits from siltstone, sandstone, limestone, and some granite

16 Howard-Fredon association: Deep, somewhat excessively drained to poorly drained, medium-textured and moderately coarse textured soils formed in water-sorted deposits from siltstone, sandstone, limestone, and some granite

17 Hinckley-Windsor association: Deep, excessively drained, coarse-textured soils formed in water-sorted deposits of sand, or gravel and sand, that are rich in granite and gneiss

*Texture as used in this legend refers to that of the surface layer unless otherwise stated.

Compiled 1973



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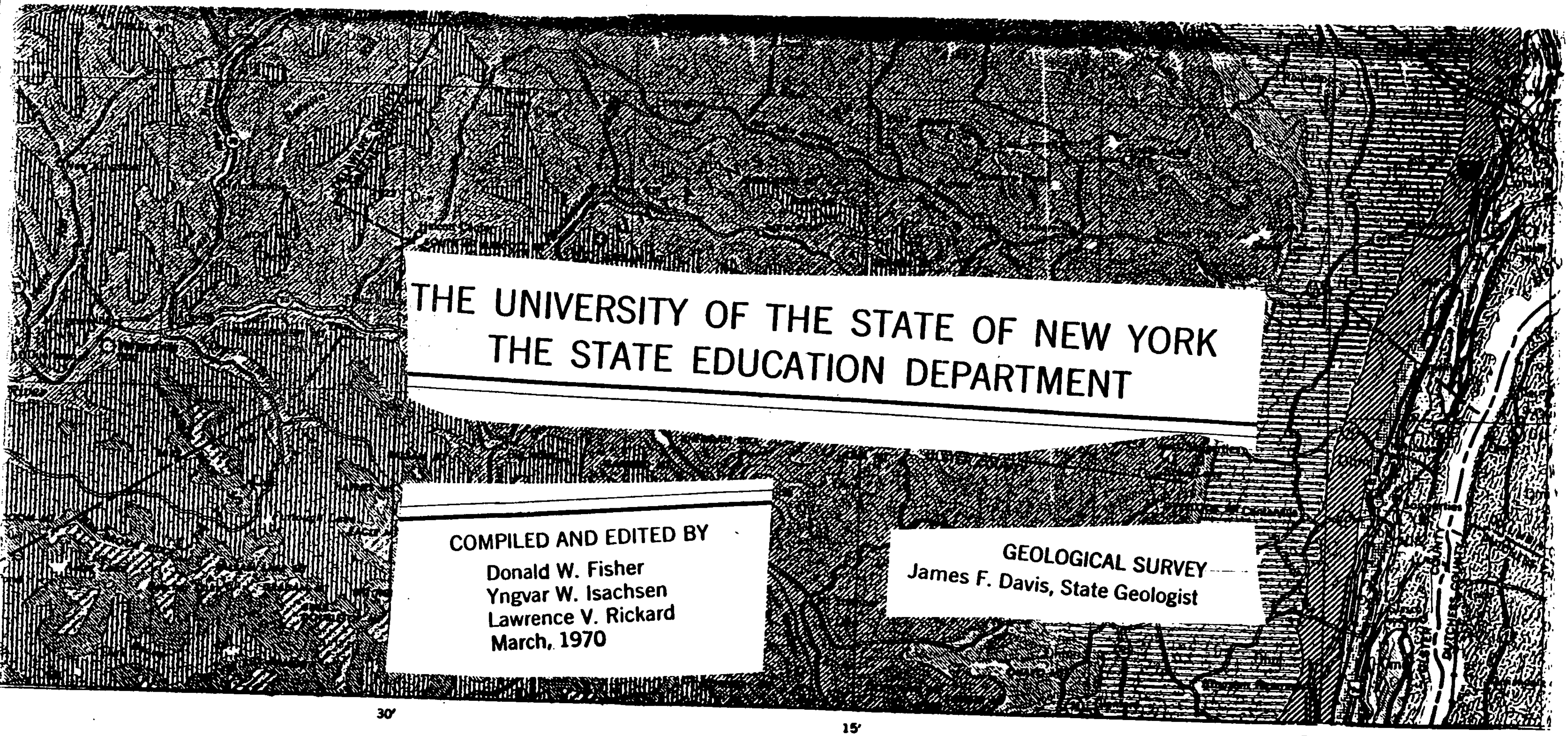


GEOLOGIC MAP OF NEW YORK

1970

Hudson–Mohawk Sheet

Scale 1:250,000

5 0 5 10 15 Statute Miles 20

5 0 5 10 15 20 25 Kilometers 30

CONTOUR INTERVAL 100 FEET

Delta Reservoir
Elmer Hill
ROME
East Floyd
Holland Patent
Floyd
Stittville
South Trenton
Dewey Corners
Marcy
Oriskany
Colemans
Whitesboro
Maynard
Yorkville
Deerfield
West Schuyler
N Y Mills
Clark Mills
Kirkland
Clinton
New Hartford
UTICA
South Reservoir
SITE
Frankfort
Ilion
Norway
DAIRY HILL
TANNER HILL
Fairfield
Little Falls
Paris
Hubbard Corners
Bangerfield
West Winfield
Winfield
Bridgewater
ONEIDA COUNTY
MADISON COUNTY
North Brookfield
Brookfield
Columbia
Cullen
Jordanville
Paines Hollow
CANADARAGO LAKE
OTSEGO LAKE
Sixmile Pt
Sears Pond
Ou
Of
Opw
Obr
Scl
Dhg
Dhm

LEGEND

SEWAGE TREATMENT PLANT
MAJOR WASTEWATER DISCHARGE POIN
MINOR WASTEWATER DISCHARGE POIN
COMBINED SEWER OVERFLOW POINT
SEPTAGE DISPOSAL SITE
SEWAGE PUMP-OUT FACILITY
SLUDGE DISPOSAL SITE
SANITARY LANDFILL SITE
INDUSTRIAL WASTE DISPOSAL SITE

PUBLIC SURFACE WATER SUPPLY
SURFACE WATER INTAKE
PUBLIC GROUNDWATER SUPPLY
Single Spring or Well
Multiple Springs or Wells
PUBLIC WATER STORAGE TANKS
Single Storage Tank
Multiple Storage Tanks
WATER TREATMENT FACILITY
WATER TRANSMISSION LINE

AREA OF WATER SERVICE ONLY
AREA OF SEWER SERVICE ONLY
AREA OF COINCIDENT WATER AND SEW

REFERENCE NO. 7

NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-9003-17	7/25/90	1355

DISTRIBUTION:

Sperry Univac File

BETWEEN:	OF:	PHONE:
Frank Palumbo	Frankfort Water Dept.	(315) 894-5116

AND:

Paul Bauer

DISCUSSION:

The Village of Frankfort obtains its municipal water supply from 3 wells. Well No 1 and Well No 2 are located on the North side of Frankfort on Industrial Drive near the New York Central RR. Well No 3 identified as the Litchfield well is located by the Litchfield Pumphouse on Litchfield St on the South side of Frankfort. Well No 1 and Well No 2 are both 80 feet Deep. Well No. 3 is 60 feet Deep. Well No. 1 is currently shut down due contamination, Frank believes the contaminant is Trichloroethane. They are in the process of installing an Air stripper. Well No 3 feeds a supply tank which in turns feed into the system. They have a surface water intake on the Frankfort Reservior south east of town which is used as emergency Backup. They have not had to use it yet. The municipal

ACTION ITEMS:

supply serves approximately 1400 connections. He knows of no surface water intakes on the Mohawk River

NUS 067 REVISED 0685

REFERENCE NO. 8

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68023970
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
8401 Corporate Drive
Landover, Maryland 20785

Submitted: December 1, 1986

I

LOCKWOOD FARMS
LATITUDE 43: 4:22 LONGITUDE 75: 6:27 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	*0	*0	*0	*0	2785	7787	10572
RING TOTALS	0 34	0 49	0 121	0 482	2785 3267	7787 11,054	10572

I

LOCKWOOD FARMS
LATITUDE 43: 4:22 LONGITUDE 75: 6:27 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	*0	*0	*0	*0	962	2743	3705
RING TOTALS	0	0	0	0	962	2743	3705

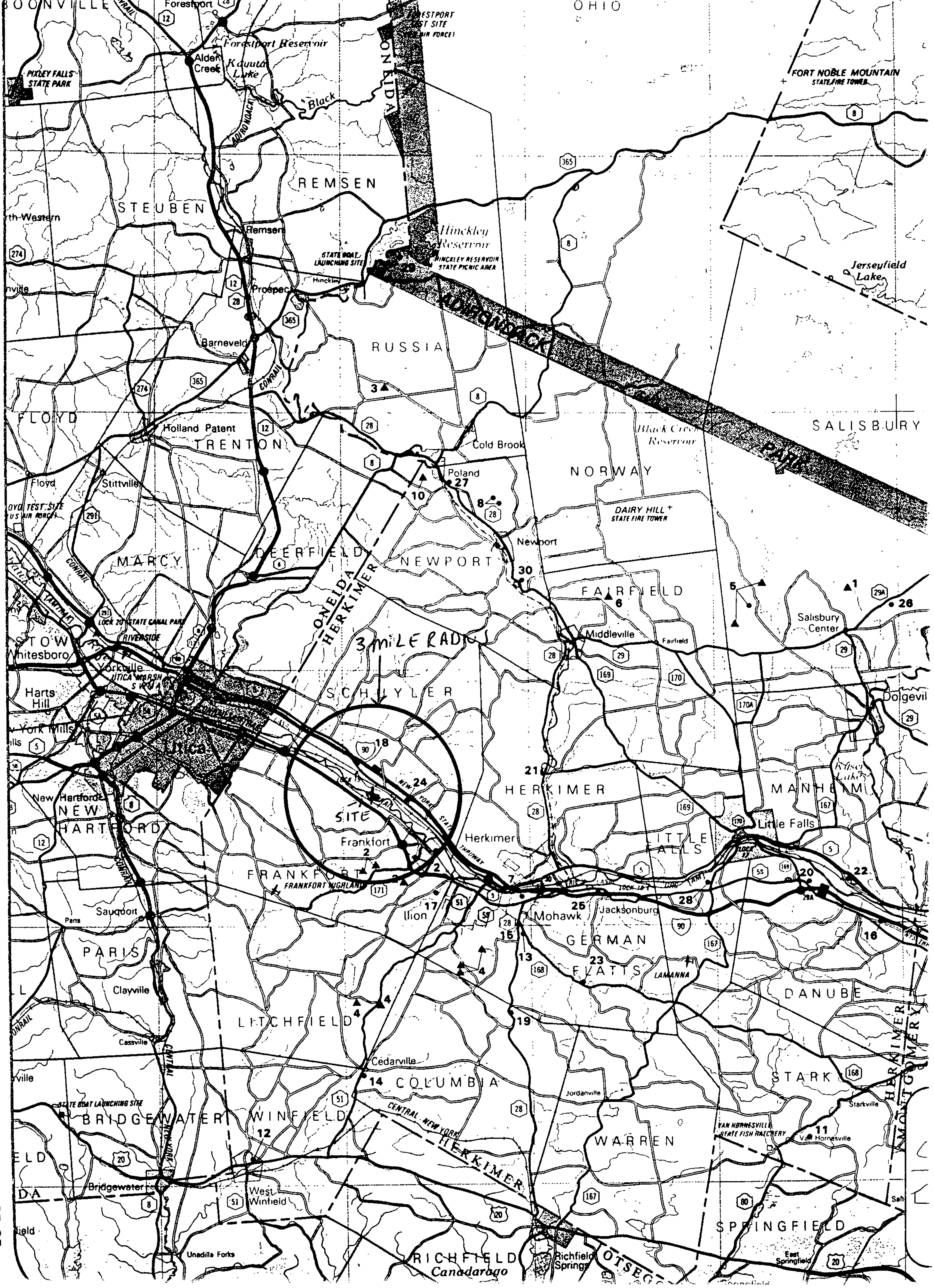
Distance (miles)	Population	Housing
1/4	34	9
1/2	~~15~~ 49	4
1	~~72~~ 121	19
2	~~361~~ 482	95
3	~~2785~~ 3267	926
4	7787	2743

*House count From U.S. Department of the Interior, U.S. Geologic Survey Topographic Map, 7.5 minute series: "Ilion Quadrangle, New York" 1943. No recent map or photos available. Conversion to population assuming 3.8 people per house.

REFERENCE NO. 9

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION



BOONVILLE
Forestport
OHIO
FORESTPORT TEST SITE
Forestport Reservoir
Alder Creek
Kayuta Lake
PIXLEY FALLS STATE PARK
FORT NOBLE MOUNTAIN
STATE FIRE TOWER
Black
ONEIDA
REMSEN
STEUBEN
Remsen
Hinckley Reservoir
STATE BOAT LAUNCHING SITE
HINCKLEY RESERVOIR STATE PICNIC AREA
Jerseyfield Lake
Prospect
Hinckley
ADIRONDACK
PARK
Barneveld
RUSSIA
CONRAIL
FLOYD
Holland Patent
TRENTON
Cold Brook
Black Creek Reservoir
SALISBURY
Poland
NORWAY
Floyd
Stittville
FLOYD TEST SITE
US AIR FORCE
DAIRY HILL
STATE FIRE TOWER
Newport
MARCY
DEERFIELD
NEWPORT
ONEIDA
HERKIMER
FAIRFIELD
LOCK 20 STATE CANAL PARK
RIVERSIDE
Middleville
Fairfield
Salisbury Center
Whitesboro
3 miLE RADIUS
Yorkville
UTICA MARSH
Harts Hill
SCHUYLER
Dolgeville
New York Mills
Utica
NEW YORK STATE THRUWAY
HERKIMER
MANHEIM
New Hartford
NEW HARTFORD
SITE
Frankfort
Herkimer
LITTLE FALLS
Little Falls
FRANKFORT
FRANKFORT HIGHLANDS
Ilion
Mohawk
Jacksonburg
Sauquoit
GERMAN
FLATTS
LAMANNA
PARIS
DANUBE
Clayville
LITCHFIELD
Cassville
CENTRAL
Cedarville
STARK
COLUMBIA
Jordanville
Starkville
STATE BOAT LAUNCHING SITE
BRIDGEWATER
WINFIELD
CENTRAL NEW YORK
VAN HORNESVILLE STATE FISH HATCHERY
Van Hornesville
WARREN
HERKIMER
MONTGOMERY
Bridgewater
West Winfield
SPRINGFIELD
Unadilla Forks
RICHFIELD
Canadarago
Richfield Springs
OTSEGO
East Springfield

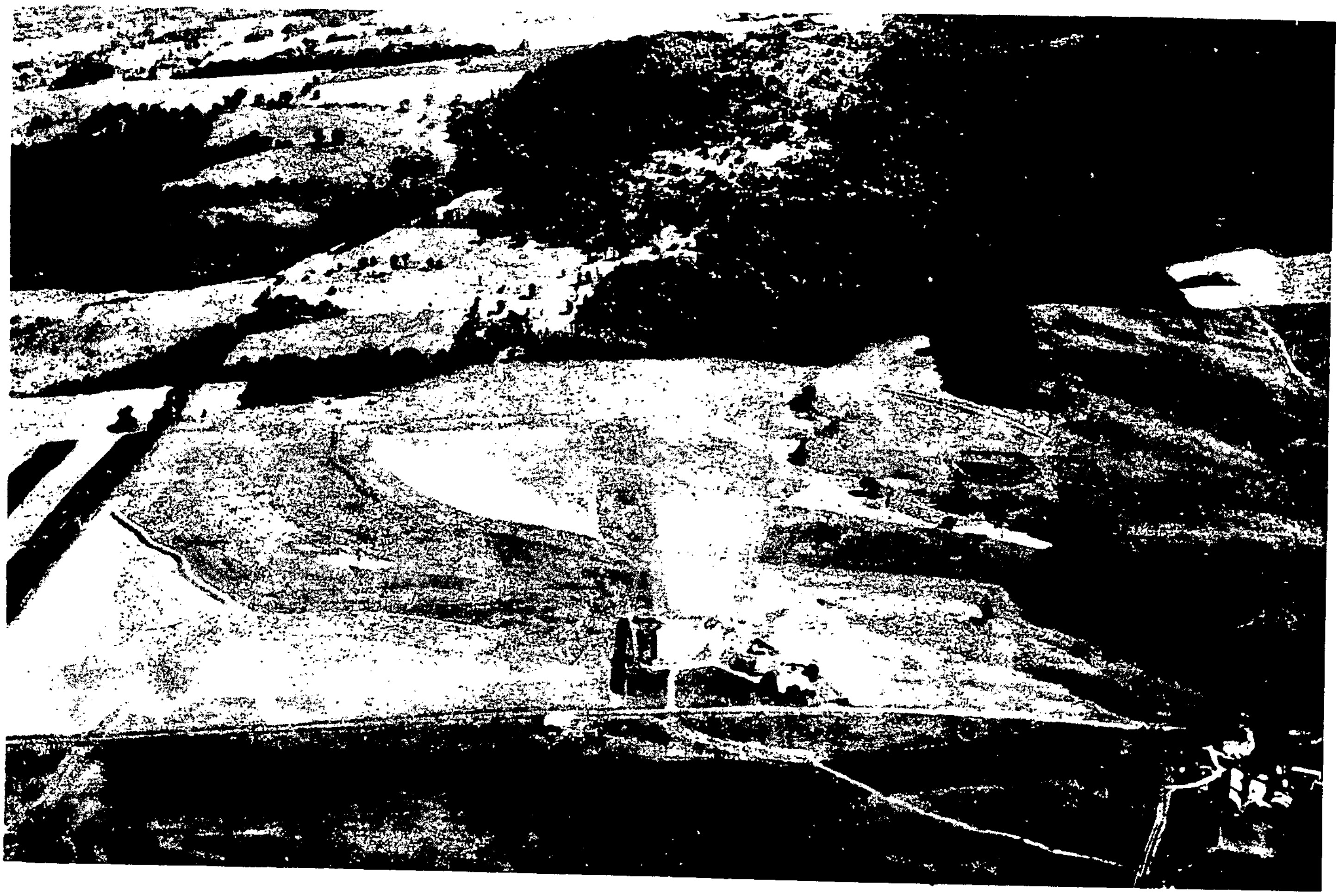
HERKIMER COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Dolgeville Village	2600	Cold & Mang Brooks
2	Frankfort Village	4325	Moyer Creek, Reservoir, Wells
3	Herkimer Village	9100	Mill Creek Reservoir
4	Ilion Village	9800	Clappsaddle, Hawks, Litchfield & Steele Creeks
5	Little Falls City	8000	Beaver Creek Reservoir, Springs, Spruce Lake
6	Middleville Village	725	Kenyon Brook
7	Mohawk Village	3300	Wells
8	Newport Village	900	Wells (Springs)
9	Old Forge Water District	3000	Independence Lake
10	Poland Village	650	Springs
11	Van Hornsville	120	Wells (Springs)
12	West Winfield Village	2967	Wells
Non-Municipal Community			
13	Brookhaven Trailer Park	36	Wells
14	Cedarhurst Park	35	Wells
15	Creekside Park	25	Wells
16	Danube Trailer Park	21	Wells
17	Delin Estates	95	Wells
18	Elmtree Estates	161	Wells
19	Golden Horseshoe Trailer Park	63	Wells
20	Homestead Trailer Park & Sales	137	Wells
21	Kastbridge Estates	116	Wells
22	Kuyrkendall Court Mobile Home	84	Wells
23	Leatherstocking Estates	77	Wells
24	Miller Grove Trailer Park	217	Wells
25	Mountainview Trailer Park	20	Wells
26	Pinecrest Bible Training Center	NA	Wells
27	Sportsman Trailer Park	70	Wells
28	Sunsetview Mobile Home Park	50	Wells
29	Trails End Campsite	150	Wells
30	White Creek Mobile Home Park	10	Wells

REFERENCE NO. 10

SOIL SURVEY OF

Herkimer County, New York, Southern Part



United States Department of Agriculture
Soil Conservation Service
In cooperation with
Cornell University Agricultural Experiment Station

Contents

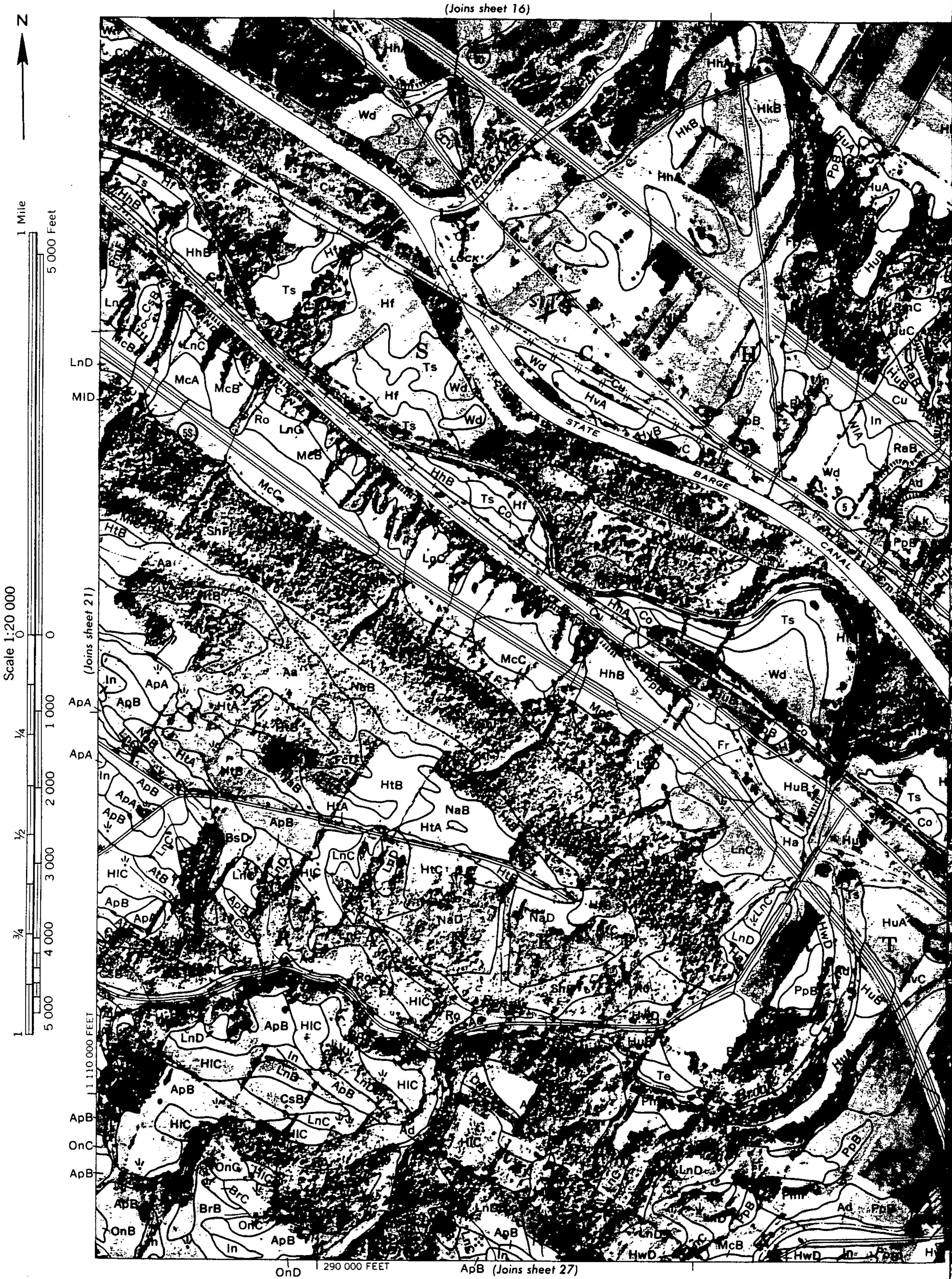
Issued May 1975

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. Other information is given in tables as follows:

Estimated average yields per acre of specified field crops under two levels of management, table 1, page 24.
Suitability of the soils for woodland, table 2, page 28.
Suitability of the soils for wildlife habitat, table 3, page 34.
Engineering uses of the soils, tables 4, 5, and 6, pages 40 through 85.
Estimated degree and kind of limitation of the soils for town and country planning, table 7, page 90.
Approximate acreage and proportionate extent of the soils, table 8, page 106.

Map symbol	Mapping unit	Page	Capability unit		Woodland suitability group
			Symbol	Page	Number
Aa	Allis silt loam	107	IVw-2	21	5w1
Ad	Alluvial land	107	----	--	---
ApA	Appleton silt loam, 0 to 3 percent slopes	108	IIIw-1	18	3w1
ApB	Appleton silt loam, 3 to 8 percent slopes	108	IIIw-3	18	3w1
AtB	Appleton and Manheim very stony silt loams, 0 to 8 percent slopes	109	VIIs-4	23	3w1
BoB	Bombay very fine sandy loam, 3 to 8 percent slopes	109	IIe-4	13	2o1
BoC	Bombay very fine sandy loam, 8 to 15 percent slopes	110	IIIe-4	17	2o1
BrB	Broadalbin loam, 2 to 8 percent slopes	111	IIe-6	14	3o1
BrC	Broadalbin loam, 8 to 15 percent slopes	111	IIIe-3	16	3r1
BrD	Broadalbin loam, 15 to 25 percent slopes	111	IVe-3	20	3r2
BsD	Broadalbin and Lansing extremely stony soils, 0 to 25 percent slopes	111	VIIs-1	22	3x1
BuA	Burdett silt loam, 0 to 3 percent slopes	112	IIIw-1	18	3w1
BuB	Burdett silt loam, 3 to 8 percent slopes	113	IIIw-3	18	3w1
BuC	Burdett silt loam, 8 to 15 percent slopes	113	IIIe-6	17	3w1
CaB	Canton stony very fine sandy loam, 2 to 8 percent slopes	114	IIe-1	13	4o1
CaC	Canton stony very fine sandy loam, 8 to 15 percent slopes	114	IIIe-1	16	4o1
Cm	Carlisle muck	114	----	--	5w2
Co	Cohoctah mucky very fine sandy loam	115	VIw-1	22	5w2
CsB	Conesus silt loam, 2 to 8 percent slopes	116	IIe-4	13	2o1
Cu	Cut and fill land	116	----	--	---
FaC	Farmington silt loam, 0 to 8 percent slopes	117	IIIs-2	20	5d1
FcD	Farmington very rocky silt loam, 0 to 25 percent slopes	117	VIIs-3	23	5x1
FkE	Farmington-Rock land complex, steep	118	VIIs-3	23	5x2
Fr	Fredon fine sandy loam	118	IIIw-1	18	3w2
Fw	Fresh water marsh	118	VIIIw-1	23	---
Ha	Halsey soils	119	IVw-1	21	5w2
He	Hamlin fine sandy loam	120	I-2	13	2o1
Hf	Hamlin silt loam	120	I-2	13	2o1
HgB	Hartland-Agawam complex, 3 to 8 percent slopes	120	IIe-3	13	3o1
HgC	Hartland-Agawam complex, 8 to 15 percent slopes	121	IIIe-3	16	3r1
HgD	Hartland-Agawam complex, 15 to 25 percent slopes	121	IVe-3	20	3r2
HhA	Herkimer gravelly silt loam, 0 to 3 percent slopes	122	I-1	12	2o1
HhB	Herkimer gravelly silt loam, 3 to 8 percent slopes	122	IIe-7	14	2o1
HkB	Herkimer gravelly silt loam, moderately well drained, 0 to 4 percent slopes	122	IIw-1	15	2o1
HlB	Hilton silt loam, 3 to 8 percent slopes	123	IIe-4	13	2o1
HlC	Hilton silt loam, 8 to 15 percent slopes	123	IIIe-4	17	2o1
HmA	Hinckley gravelly loamy sand, 0 to 3 percent slopes	124	IVs-1	21	5s1
HmB	Hinckley gravelly loamy sand, 3 to 8 percent slopes	124	IVs-1	21	5s1
HmC	Hinckley gravelly loamy sand, 8 to 15 percent slopes	125	VIIs-2	22	5s1
HnD	Hinckley and Windsor soils, 15 to 25 percent slopes	125	VIIs-2	22	5s2
HnF	Hinckley and Windsor soils, 25 to 70 percent slopes	125	VIIe-1	22	5s3
HoB	Honeoye silt loam, 3 to 8 percent slopes	126	IIe-1	13	2o1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C—46 to 75 inches, dark grayish-brown (10YR 4/2) crushed, shaly loam; massive; friable; few fine roots; 15 percent gravel; 30 percent weak fragments of dark-colored shale oriented horizontally; neutral; calcareous at a depth of 74 inches.

The solum ranges from 24 to 48 inches in thickness. The depth to carbonates ranges from 40 to 75 inches. The depth to bedrock is more than 40 inches. Hard, coarse fragments range from 5 to 30 percent. Soft fragments of dark-colored shale range from few to 30 percent in the upper part of the solum, and from 20 to 60 percent in the lower part of the B and C horizons. The upper horizons range from medium acid to neutral. Reaction increases with depth.

The Ap horizon ranges from black (10YR 2/1) to very dark grayish brown (2.5Y 3/2) in color. It is weak to moderate, granular in structure, and is very friable to friable. The B horizon has a color value the same or one unit higher than that of the Ap horizon and chroma is the same to two units higher. The B horizon is fine sandy loam to silt loam. It is very weak to moderate, very fine to medium, subangular blocky in structure. Clay films are lacking or cover less than 1 percent of the faces of peds. The C horizon ranges from very dark grayish brown (2.5Y 3/2) to dark yellowish brown (10YR 4/4) in color. It contains layers of dark-colored shale fragments and gravelly or shaly loams or silt loams in some profiles. It is weak, platy in structure or is structureless (massive), and is friable or loose.

Herkimer soils are often near Howard, Palmyra, Phelps, Fredon, and Halsey soils, all of which formed in glacial outwash. Herkimer soils contain more dark-colored shale, have darker colored sola, and lack the Bt horizons of Howard, Palmyra, and Phelps soils. They are drier than the somewhat poorly drained to poorly drained Fredon and the very poorly drained Halsey soils.

Herkimer gravelly silt loam, 0 to 3 percent slopes (HhA).—This level to nearly level soil is on the base of old alluvial fans where streams from regions of dark-colored calcareous shale enter major valleys. Individual areas are fan shaped, and range from 5 to 100 acres. This soil has the profile described as representative for the series.

Included with this soil in mapping were small areas of the moderately well drained phase of Herkimer soils and wetter Fredon soils, a few spots of Howard and Palmyra soils, and small areas where the surface layer is gravelly loam. In a few places red and green shale chips are a conspicuous part of the soil mass.

This well-drained soil is suited to most crops grown in the county and to hay, pasture, or trees. Few limitations to intensive cultivation exist, other than the presence of some gravelly fragments and cobblestones that interfere with precision cultivation of some vegetable crops. Capability unit I–1; woodland suitability group 2o1.

Herkimer gravelly silt loam, 3 to 8 percent slopes (HhB).—This gently sloping soil has a profile similar to the one described as representative for the series except that in places it contains a greater volume of hard gravelly fragments. It is on apex areas of old alluvial fans where streams from regions of dark-colored calcareous shale enter major valleys. Individual areas are fan shaped, and range from 5 to 80 acres.

Included with this soil in mapping were small areas of the moderately well drained phase of Herkimer soils, a few spots of Howard and Palmyra soils, and small areas where the surface layer is gravelly loam. In a few spots, red and green shale chips are a conspicuous part of the soil mass.

This well-drained soil is suited to most crops grown in the county and to hay, pasture, or trees. The hazard of erosion is slight to moderate in cultivated areas that are unprotected. Contour measures for control of erosion are generally easy to establish. Gravelly fragments and cobblestones interfere with precision cultivation of some vegetable crops. Capability unit IIe–7; woodland suitability group 2o1.

Herkimer gravelly silt loam, moderately well drained, 0 to 4 percent slopes (HkB).—This level to very gently sloping soil has a profile similar to the one described as representative for the series except that there are some mottles in the subsoil that were caused by a seasonal high water table. This soil is on areas of old alluvial fans where streams from regions of dark-colored calcareous shale enter major valleys. Individual areas are irregularly shaped, and range from 5 to 100 acres.

Included with this soil in mapping were small areas of well-drained Herkimer soils, and similar Phelps soils that contain few dark-colored shale chips. Also included, in low areas, were spots of wetter Fredon and Halsey soils. In a few places, red and green shale chips are a conspicuous part of the soil mass.

This soil is suited to most crops grown in the county and to hay, pasture, or trees. Slight wetness in places delays planting briefly in the spring. To provide more uniform drainage conditions in fields, random drainage of included wet areas is desirable in places. Gravelly fragments and cobblestones interfere with precision cultivation of some vegetable crops. Capability unit IIw–1; woodland suitability group 2o1.

Hilton Series

The Hilton series consists of deep, moderately well drained, medium-textured soils that formed in loamy glacial till derived mainly from sandstone and limestone. These soils are gently sloping to moderately sloping and are on upland till plains where some runoff water accumulates. They are medium in lime.

In a representative profile the surface layer is dark-brown silt loam that contains a noticeable amount of pebbles and is about 8 inches thick. It is underlain by a subsurface layer about 7 inches thick of brown, neutral, very friable gravelly fine sandy loam. At a depth of 15 inches is a partly leached upper part of the subsoil that consists of mottled, brown to dark-brown gravelly silt loam about 9 inches thick that is friable and slightly acid. Below a depth of 24 inches, the subsoil is mottled, brown to dark-brown gravelly heavy silt loam about 12 inches thick that is firm and slightly acid. At a depth of 36 inches this is underlain by a substratum of mottled, brown to dark-brown gravelly silt loam that is very firm and extends to a depth of 50 or more inches. It is neutral in the upper part and becomes calcareous below a depth of 45 inches.

Hilton soils have a seasonal high water table within 18 to 24 inches of the surface in spring and during wet periods. This water table is perched on the slowly permeable substratum. Maximum rooting depth is mainly 24 inches. Few roots extend below this depth. Available water capacity in the rooting zone is moderate. Available phosphorus is generally medium, and available potassium is high. Available nitrogen is generally medium. Reaction in the surface layer is strongly acid to neutral in unlimed areas. Aside from slope, a slight wetness is the principal limitation to the use of these soils for farming.

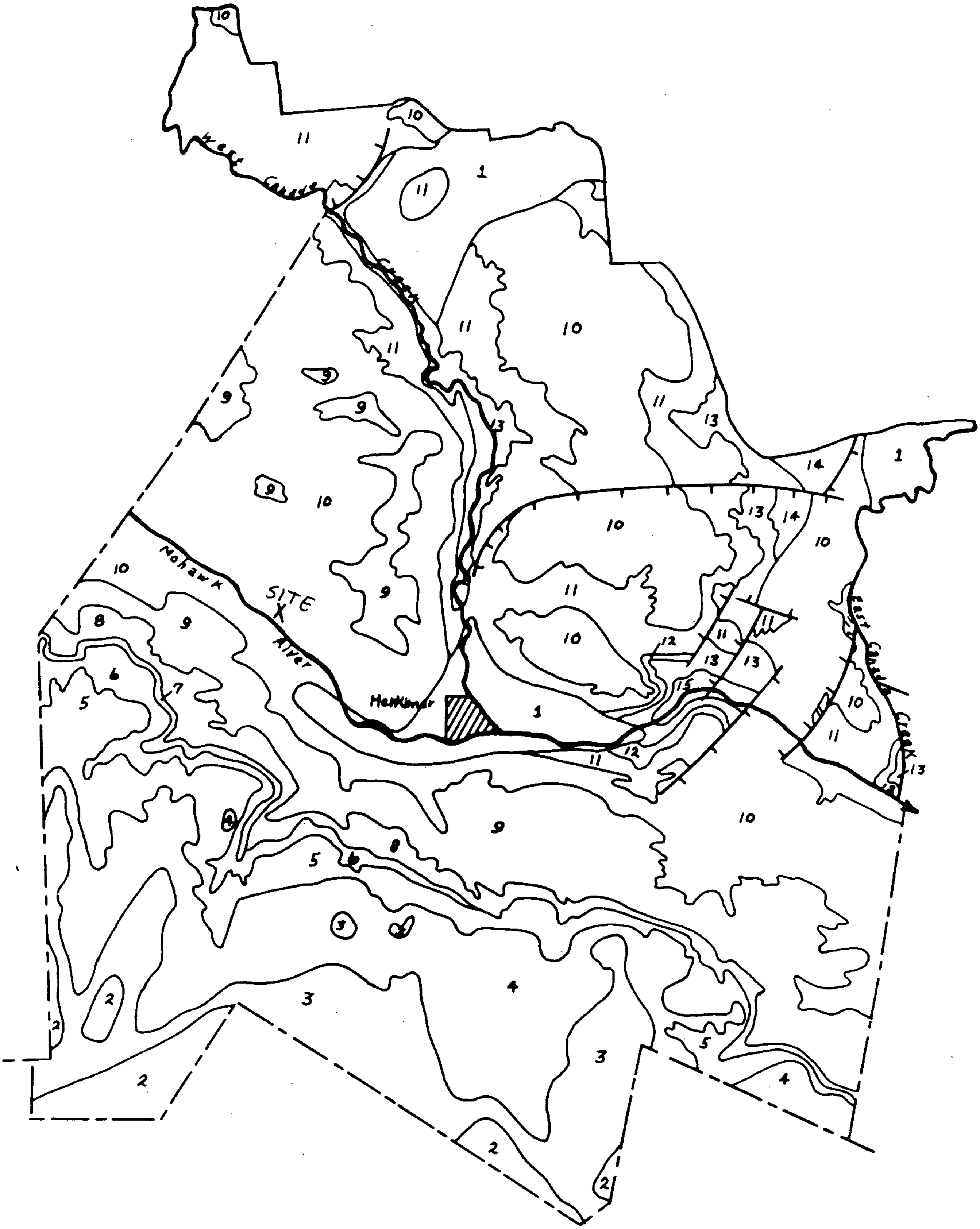


Figure 12.—Bedrock geology of Herkimer County. Key to this map explains the numbered areas.

days per winter in the river valley to up to more than 25 days in the normally colder uplands. In most winters, the coldest temperature ranges from minus 10° to 25° F.

The freeze-free growing season has an average length of about 140 days along the Mohawk River, but only about 15 days in the approaches to the Adirondack Forest Preserve.

Annual precipitation increases from south to north in southern Herkimer County, from about 40 inches along and south of the Mohawk River, up to 45 to 50 inches in the uplands north of the river. The growing-season period from May through September accounts for about 50 percent of the annual precipitation, and follows the same directional pattern. The distribution of rainfall is normally adequate for the production of crops. Drought is not a serious hazard to farming, but its possibility should not be disregarded in long-range planning.

Snowfall is heavy throughout Herkimer County. Average yearly amounts vary from about 65 inches in the southern extremity to 120 inches near the Forest Preserve boundary. Measurable snow can be expected in the higher elevations by early November, and snowstorms in late April or early May are not uncommon. A cover of snow is generally present from early December to late March, or until early April in the higher elevations.

Geology

Geologic formations (fig. 12) spanning from the Recent Quaternary Period in the Cenozoic Era to Precambrian times of more than 6 hundred million years ago crop out in the survey area of Herkimer County (*13*). The wide assortment of material is a result of several conditions. The Mohawk River bisects the area and has exposed a wide range of rocks in forming its present channel. Also, Herkimer County is so situated that the northern edge of the survey area borders on the Adirondack Mountains and its abundance of crystalline rocks, and the extreme southern part of the survey area is on the edge of the Catskill Mountains where there are sedimentary siltstone, sandstone, and shale. A further complicating factor is that the northern part of the survey area was uplifted during the formation of the Adirondacks, as evidenced by the numerous faults in the area that have their downthrown side away from the Adirondack Mountains. This uplift accelerated erosion, so that, in general, older rocks are exposed north of the Mohawk River.

Many of the soils of the survey area formed in glacial till that contains much material from these exposed formations. The glaciers that repeatedly overran the area moved and mixed the parent rock material, and many of the soils formed in such various glacial tills. The Mohawk River and the East and West Canada Creeks acted as proglacial streams when the ice sheets lay to the north of the Mohawk River. During these periods the major streams were choked with coarse-textured sand, gravel, and cobblestones from the glacial melt water. When the Mohawk River was blocked by ice to the east, these stream valleys were flooded, and lacustrine sediment was laid down over the outwash and over glacial till and bedrock in a few spots. Steele Creek was an overflow outlet to the south that drained one of these proglacial lakes. The outwash deposit from Cedarville to West Winfield in the Howard-Phelps association is a result of this overflow channel.

The present-day major streams are underfit for their valleys. This means that they carry much less water and sediment than during former times. The alluvial soils in the Alluvial land-Hamlin-Teel association formed in alluvium recently laid down by these streams. Most of this alluvium mantles coarser sediments or outwash deposited during glacial periods.

Soils of several associations formed in outwash from proglacial streams. Herkimer association soils formed in sediment dominated by outwash having a high content of Utica Shale. Howard-Phelps and Howard-Fredon associations soils formed in outwash consisting of mixed limestone, sandstone, and granitic material. The Hinckley-Windsor association soils are high in content of granitic sand and gravel from the Adirondacks. Some areas of these outwash associations are indicated as Quaternary glacial and alluvial deposits on the bedrock geology map.

KEY TO FIGURE 12. BEDROCK GEOLOGY OF HERKIMER COUNTY (*13*)

Number	Formation	Geologic Period	Geologic Era
1	Glacial and alluvial deposits—underlying geology unknown	Quaternary	Cenozoic.
2	Hamilton group—shale, siltstone	Middle Devonian	Paleozoic.
3	Onondaga limestone and Ulster group—limestone, sandstone	Middle Devonian	Paleozoic.
4	Helderberg group—limestone	Lower Devonian	Paleozoic.
5	Cobleskill limestone, Bertie and Saline groups—limestone	Upper Silurian	Paleozoic.
6	Cobleskill limestone, Bertie and Saline groups—Vernon shale	Upper Silurian	Paleozoic.
7	Lockport group—Ilion shale	Middle Silurian	Paleozoic.
8	Clinton group—Herkimer sandstone	Middle Silurian	Paleozoic.
9	Lorraine group—Frankfort shale, siltstone	Upper Ordovician	Paleozoic.
10	Trenton group (black shale)—Utica shale	Middle Ordovician	Paleozoic.
11	Trenton group (limestone)—limestone	Middle Ordovician	Paleozoic.
12	Beckmantown and Saratoga Springs Group—limestone, dolomite	Lower Ordovician	Paleozoic.
13	Beckmantown and Saratoga Springs Group—Little Falls dolomite	Upper Cambrian	Paleozoic.
14	Rocks of igneous origin, generally metamorphosed—undivided metasedimentary rock and related migmatite.		Precambrian.
15	Metamorphic rocks of uncertain origin—syenitic gneisses, or quartz syenitic gneisses.		Precambrian.

WATER RESOURCES OF INDUSTRIAL AREAS

WATER RESOURCES OF THE UTICA-ROME AREA, NEW YORK

By H. N. HALBERG, O. P. HUNT, and F. H. PAUSZEK

ABSTRACT

The Utica-Rome area is along the Mohawk River and New York State Erie (Barge) Canal about midway between Lake Ontario and Albany. It encompasses about 390 square miles centered around the industrial cities of Utica and Rome.

The Mohawk River, its tributary West Canada Creek, and a system of reservoirs and diversions to maintain the flow in the barge-canal system, assure an ample water supply for the foreseeable needs of the area. The water from these sources is generally of good chemical quality requiring little treatment, although that from the Mohawk River is only fair and may require some treatment for sensitive industrial processes. Additional surface water is available from smaller streams in the area, particularly Oriskany and Sauquoit Creeks, but the water from these sources is hard, and has a dissolved-solids content of more than 250 ppm (parts per million). Ground water is available in moderate quantities from unconsolidated sand and gravel deposits in the river valleys and buried bedrock channels, and in small quantities from bedrock formations and less permeable unconsolidated deposits. The quality of water from sand and gravel, and bedrock ranges from good to poor. However, where necessary, the quality can be improved with treatment.

The Mohawk River is the source of the largest quantity of water in the area. The flow of the stream below Delta Dam equals or exceeds 108 mgd (million gallons per day) 90 percent of the time, and at Little Falls it equals or exceeds 300 mgd 90 percent of the time. The flow between these two points is increased by additions from Oriskany, Sauquoit, and West Canada Creeks and from many smaller tributary streams. The flow is also increased by diversions from outside the area, from the Black and Chenango Rivers and West Canada Creek for improvement of navigation in the Erie (Barge) Canal, and from West Canada and East Branch Fish Creeks for the public supplies of Utica and Rome. Much of the public-supply water eventually reaches the river by way of sewerage and industrial waste-disposal systems. The total diversion from these sources averages more than 92 mgd. An estimated 18.5 mgd is withdrawn from the Mohawk River by industry, mostly for nonconsumptive uses.

Floods in the Utica-Rome area are not a frequent problem owing to the use of regulatory measures. The major streams fluctuate through a narrow range in stage and generally only a narrow strip along the streams is subject to flooding.

Water-bearing sand and gravel deposits in the major river valleys are the principal sources of ground water, especially where they are recharged by infiltration from streams. The most important potential source is the deposit of sand and gravel underlying the extensive plain adjacent to the Mohawk River between Delta Reservoir and Rome. Maximum sustained yields from these deposits are not known; but moderate quantities of water, 300 gpm (gallons per minute) or less from a single well, can probably be obtained from some parts of the sand plain area, particularly in the vicinity of a buried bedrock channel that extends southwestward from Delta Reservoir. Similar quantities of ground water probably can be withdrawn from some parts of the flood plain of the Mohawk River between Rome and Frankfort and from the sand and gravel deposits filling the valley of Ninemile Creek below Holland Patent. The deposits underlying the flood plain of the Mohawk River generally are fine grained but in places contain interstratified beds of coarser sand and gravel. The most productive part of the flood plain is at the east end near Frankfort. The deposits in Ninemile Creek valley also are generally fine grained; but where they are sufficiently thick, as over a buried bedrock valley southwest of Floyd, moderate quantities of water may be obtained.

Small to moderate quantities of water (150 gpm or less from a single well) can be obtained from sand and gravel deposits in the bottoms of Oriskany and Sauquoit Creek valleys, especially where the materials are coarse grained and are connected hydraulically with the streams. Small quantities of water (20 gpm or less from a single well) can be obtained from smaller areas of sand and gravel filling minor channels carved in the bedrock of the uplands and from some of the bedrock formations.

The depth to water in most wells in the Utica-Rome area ranges from 5 to 50 feet below the land surface. In general the water table is closer to the surface in the valley bottoms than in the uplands or along the sloping valley sides, where not otherwise affected by differences in geologic or hydrologic conditions. The water table is nearly flat in the flood plain of the Mohawk River and stands generally only slightly higher than the adjacent river.

The amount of water used in the area is not large. The estimated average withdrawal was about 48.5 mgd in 1954. Of this, industry used the largest amount, requiring 60 percent or about 29 mgd. About one-third of the water used by industry was self supplied, the remainder was purchased from public water systems. Of the 48.5 mgd withdrawn, about 27.4 mgd was supplied by municipally owned systems, and 21.1 mgd was obtained from private sources. About 96 percent of the total was taken from surface sources, and 4 percent was drawn from ground-water sources. All the water for municipal supply and most of the water for industry was drawn from surface sources. The uses of water in this area are mostly nonconsumptive, and they cause little depletion of the supply. However, practically all withdrawal uses add dissolved solids or suspended matter to the water and decrease its usefulness for some purposes.

INTRODUCTION

The development of the water resources of the Utica–Rome area, to meet the increasing demands of municipal and industrial expansion, requires a knowledge of the occurrence and use of water. Information is required about sources of water, quantity available, chemical and physical quality, amount used, effect of use on the quantity and quality, and magnitude and frequency of floods.

The purpose of this report is to summarize the available data on the water resources of the area and to express them in general terms. The report should be useful for initial guidance in the planning of water-supply facilities by pointing out the sources of water, by describing their quantity and quality, and by giving ground-water and flood levels. It is not within the scope of this report to provide solutions for all possible water problems that may arise owing to the establishment of new industries within the area, use of new processes within individual industries, and shifts and trends in population. Each individual problem may require its own detailed investigation and design study. The information contained in this report will serve as a foundation for individual studies and appraisals of local water potential.

Most of the basic data summarized in this report were collected over a period of years by the U.S. Geological Survey as part of programs conducted cooperatively with the New York State Departments of Commerce, Conservation, Health, and Public Works, and the New York Water Power and Control Commission. Thanks are due many individuals, well drillers, public officials, and industries for furnishing information from their files and for granting permission to the Geological Survey for the collection of field data at their installations. The authors especially wish to acknowledge the courtesy and cooperation of Mr. L. J. Griswold, chief engineer, Board of Water Supply, City of Utica, and Mr. Ralph Hadlock, Associate County Agricultural Agent, New Hartford.

The report was prepared by H. N. Halberg, under the supervision of G. C. Taylor, Jr., district geologist; O. P. Hunt, under the direct supervision of A. W. Harrington, district engineer; and F. H. Pauszek, district chemist. R. V. Cushman was responsible for staff coordination, under the general supervision of C. C. McDonald, Chief, General Hydrology Branch.

LOCATION AND EXTENT OF AREA

The area covered by this report is along the Mohawk River and Erie (Barge) Canal, about midway between Lake Ontario and Albany. It encompasses about 390 square miles and includes the highly industrialized centers of Utica and Rome and the smaller industrial and rural communities south and north of these two cities (pl. 1). The area includes Floyd, Kirkland, Marcy, New Hartford, Utica, Westmoreland, and Whitestown, and parts of Deerfield, Rome, and Trenton in Oneida County, and Frankfort and Schuyler in Herkimer County.

PHYSICAL FEATURES

The Utica–Rome area is partly within the Mohawk valley lowland and partly in the north-central margin of the Allegheny plateau. The major topographic features are the valley of the Mohawk River trending northwest-southeast across the central part of the area, the prominent upland front of the Allegheny plateau south of the river, and the rolling upland plateau north of the river. These major features are largely the result of differential erosion of the underlying sedimentary rocks.

The Mohawk valley was carved out of the underlying soft Utica shale by preglacial and glacial streams. It is now partly filled with clay, sand, and gravel deposited during the earlier formative stages of the Great Lakes. These deposits underlie the modern flood plain of the river and form the conspicuous terraces that flank the flood plain, such as those in the part of the valley between Marcy and Oriskany. The plain is about 1 mile wide in the stretch between Rome and Frankfort. The plain also extends west of Rome where it is much wider. The flanking terraces are continuous with the valley fill in the lower reaches of Ninemile, Oriskany and Sauquoit Creeks and were formed during the outflow of higher stages of the glacial Great Lakes. The surface deposits throughout the valley consist of sand and gravel with some silt and clay.

The northern front of the plateau south of the Mohawk valley rises abruptly from the inner edges of the sand and gravel terraces at an altitude of about 600 feet to summit altitudes of 1,380 feet near the southern border of the area. The bedrock is exposed in the deeply cut tributary valleys and along the steeper upland slopes. The plateau is underlain by more resistant sedimentary rocks consisting predominantly of limestone, dolomite, shale, and sandstone with several intercalated beds of iron ore. The north-facing slope is deeply dissected by two large northward-flowing tributaries of the Mohawk River, Oriskany and Sauquoit Creeks.

The rolling plateau north of the river slopes gently from an altitude of 1,300 feet southward to an altitude of about 600 feet along the Mohawk River. It is underlain by the Utica and Frankfort shales, the latter being the more resistant and capping the higher hills. The plateau surface is scarred deeply by West Canada and Ninemile Creeks and several other smaller tributaries of the Mohawk River, exposing the underlying shale beds. Elsewhere in the upland area the bedrock is covered by a veneer of ground moraine (till).

The area is drained by the Mohawk River except the westernmost part, which is drained by the Oswego River, through Wood Creek and the drainage west of Rome (pl. 1). The Mohawk River enters the area north of Rome and flows in a meandering path through the central part of the Utica-Rome area to the eastern edge at Frankfort. Within this reach it has a fall of only about 40 feet and within its wide flat valley is most of the industry in the area. In places some of the river water is diverted by the Erie (Barge) Canal, which parallels its course from Rome to the eastern border of the area. The main tributaries of the Mohawk River within the area are Oriskany and Sauquoit Creeks, which enter from the south, and Ninemile Creek, which enters from the north. West Canada Creek forms the northeastern border of the area and enters the Mohawk River to the east. During the navigation season, Ninemile Creek carries water that is diverted from West Canada Creek basin to the Erie (Barge) Canal. Industrial development has occurred primarily along the Mohawk River and to the south along Oriskany and Sauquoit Creeks.

SOURCES OF SURFACE WATER

The water resources of the Utica-Rome area are its most important natural resource. The Mohawk River and its larger tributaries, Oriskany, Sauquoit, and West Canada Creeks, are the important sources of water in the area and assure an ample supply of good or improvable quality for all foreseeable needs. Additional surface water is obtained outside the area from East Branch Fish Creek in the Lake Ontario basin.

MOHAWK RIVER

The Mohawk River is formed by the confluence of its east and west branches just north of the Utica-Rome area. About 9 miles downstream from this point it enters and flows through Delta Reservoir, the lower or outflow end of which is just within the report area (pl. 1). Immediately south of Rome, the Mohawk River is intersected and crossed by the Erie (Barge) Canal, Division of the New York State Barge Canal System. The flow of the Mohawk River is divided between an integrated canal and river system from Rome until the river becomes the canal at Frankfort just east of the report area. The canal is north of the river and parallel to it, receiving the water from all tributaries to the north; the river receives the flow of tributaries to the south.

The Mohawk River is economically important to the thousands of people residing in the Utica-Rome area and to the State of New York. It supplies water for industrial use, recharges adjacent ground-water reservoirs, and provides a medium for sewage and waste disposal. An estimated 18.5 mgd is withdrawn from the river by industries in Rome and Utica for cooling and process purposes. Most of this water is returned to the river after use.

633991 O—62——2

The flow of the Mohawk River in the Utica-Rome area is regulated by the operation of Delta Reservoir and several diversions or feeders (Black River, Ninemile, and Oriskany Creek feeders) which bring water into the area in order to maintain a reasonably constant flow through the Erie (Barge) Canal during the canal operating season. Delta Reservoir was completed in 1912 and has a usable capacity of 21,000 million gallons. Water is diverted from the Black River at Forestport, about 11 miles northeast of the area, through Forestport feeder and Black River Canal (flowing south), into Delta Reservoir. Diversion for the 1953 water year averaged 16.6 mgd (25.7 cfs). (A water year begins on October 1 and ends on September 30, the dates selected to facilitate water studies.) Water also is diverted from the West Canada Creek basin at Trenton Falls through Ninemile feeder and reaches the Erie (Barge) Canal through Ninemile Creek about 7 miles northwest of Utica. Records of diversion through Ninemile feeder (navigation season only) have been collected by the Geological Survey since 1919 at a gaging station near Holland Patent. The amount of diversion depends upon requirements for navigation. For example, during the 1938 and 1948 canal seasons, there was no diversion; from June 15 to December 8 of the 1953 canal season, the diversion averaged 38 mgd (59.2 cfs). The maximum diversion occurred from April 28 to October 30 of the 1941 canal season when the flow averaged 101 mgd (156 cfs). The canal season usually begins about mid-April and ends about December 1. Oriskany Creek feeder diverts water from the upper Chenango River basin into Oriskany Creek near Solsville. No record is available of the amount of the diversion. Water occasionally may be received from the Oswego River basin through the summit level of the Erie (Barge) Canal near Rome.

The flow of the Mohawk River in the Utica-Rome area also is increased by diversions for the public water supplies of Utica and Rome which reach the river by way of public sewer and industrial waste-disposal systems. The amounts of these diversions are discussed under public water-supply systems. Figure 1 shows where water is diverted to the area and indicates the average amount of diversion in 1953 where records are available.

The flow of the Mohawk River is measured at gaging stations below Delta Dam, where the river enters the area, and below Rocky Rift Dam near Little Falls, about 19 miles east of the area. (See pl. 1; fig. 2, and table 1.) The New York State Department of Public Works also obtains records of stage at each lock in the Erie (Barge) Canal system.

The flow of the Mohawk River at the gage below Delta Dam is completely regulated by Delta Reservoir except during periods of

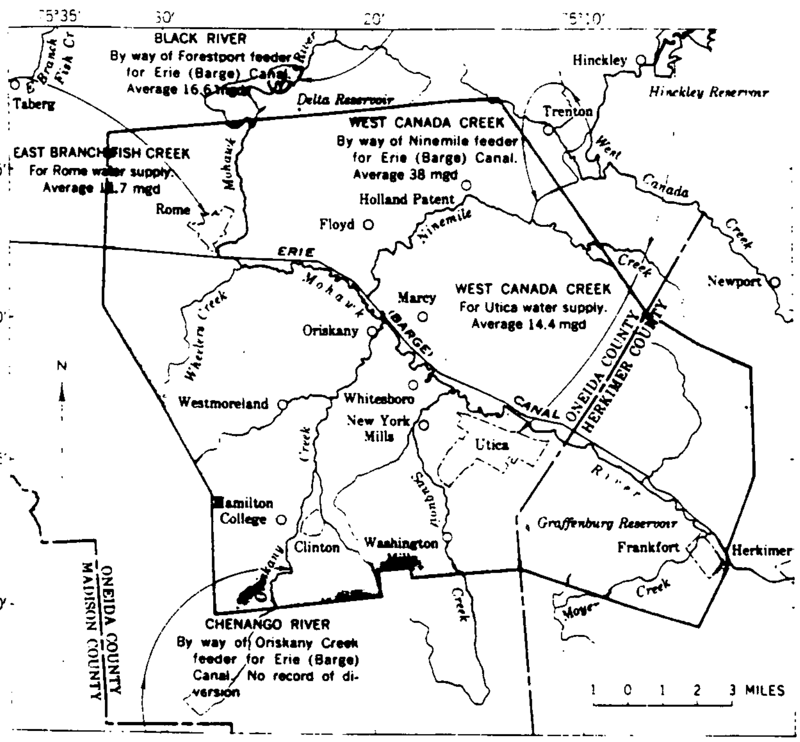


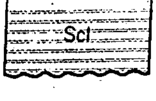
FIGURE 1.—Outline map showing location and amount of major diversions of water into the Utica-Rome area, 1953.

spilling. The pattern of regulation remained practically unchanged during the time records were collected, so that all records at this station represent conditions under the present pattern of diversion and storage. Average observed discharge for the 32-year period 1921–53 was 259 mgd (401 cfs). Observed monthly discharge (fig. 3) during this period ranged from a maximum of 1,034 mgd (1,600 cfs) to a minimum of 49.1 mgd (76 cfs).

The flow-duration curve, figure 4, shows the percentage of time the daily flow of Mohawk River below Delta Dam equaled or exceeded different quantities. For example, the curve indicates that the flow would be equal to or exceed 66 mgd (102 cfs) 99 percent of the time, and would be at least 108 mgd (167 cfs) 90 percent of the time. The flow would equal or exceed 259 mgd (401 cfs, average flow below Delta Dam) about 30 percent of the time. The flow during the summer and fall is maintained well above natural low-flow conditions in accordance with requirements for navigation.

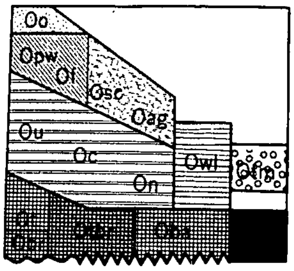
No gaging stations are maintained on that part of the Mohawk River between Delta Dam and Little Falls and therefore no records of flow are available in the vicinity of Utica where the river leaves

Silurian



Scl Herkimer Sandstone including Joslin Hill and Jordanville Members; Kirkland Hematite; Willowvale Shale; Westmoreland Hematite; Sauquoit Formation—sandstone, shale; Otsquago Sandstone; Oneida Conglomerate.

LORRAINE, TRENTON, AND BLACK RIVER GROUPS
up to 4,500 ft. (1400 m.)



Oo Oswego Sandstone

Opw Pulaski and Whetstone Gulf Formations—shale, siltstone.

Of Frankfort Formation—shale, siltstone.

Osc Schenectady Formation—graywacke, sandstone, siltstone, shale.

Oag Austin Glen Formation—graywacke, shale.

Ou Utica Shale.

Oc Canajoharie Shale.

On Normanskill Shale—minor mudstone, sandstone.

Owl Walloomsac Formation—slate, phyllite, schist, metagraywacke.

Ot Trenton Group. Denley, Sugar River, Kings Falls, and Rockland Limestones.

Obr Black River Group: Chaumont Limestone—chert; Lowville Limestone; Pamelia Dolostone.

Otbr Mohawk Valley: Trenton and Black River Groups—Dolgeville, Denley, Sugar River, Kings Falls, Glens Falls, Rockland, Amsterdam, and Lowville Limestones.
Washington County: Glens Falls and Orwell Limestones.

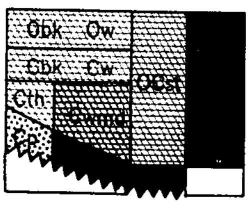
Oba Balmville Limestone. Vermont: Whipple Limestone.

Otm Taconic Mélange—chaotic mixture of Early Cambrian thru Middle Ordovician pebble to block-size angular to rounded clasts in a pelitic matrix of Middle Ordovician (Barneveld) age. Rims and floors earlier submarine gravity slides of Taconian Orogeny.

O€s Cambrian thru Middle Ordovician (Barneveld) carbonate rocks occurring as slivers caught along thrusts of later allochthones, or carbonate blocks in Taconic Mélange.

O€h Horses along normal faults.

BEEKMANTOWN AND STOCKBRIDGE GROUPS, POTSDAM SANDSTONE, AND VERMONT VALLEY SEQUENCE
up to 3,500 ft. (1100 m.)



Obk Beekmantown Group.
Mohawk Valley: Chuctanunda Creek Dolostone; Tribes Hill Formation—limestone, dolostone; Gailor Dolostone.
Washington County: Providence Island Dolostone; Fort Cassin Formation—limestone, dolostone; Fort Ann Formation—limestone, dolostone; Cutting Formation—dolostone, local chert, limestone at top, siltstone at base.

Ow Columbia County: Copake Formation—limestone, dolostone; Rochdale Limestone; Halcyon Lake Formation—chert, calc-dolostone.

O€st Stockbridge Formation—calcitic and dolomitic marble.

O€s slivers, as O€s above.

€bk Beekmantown Group.
Mohawk Valley: Little Falls Dolostone—chert; Hoyt Formation—limestone, dolostone, oolite.
Washington County: Whitehall Formation—dolostone, limestone; Ticonderoga Dolostone—chert.

€w Columbia County: Briarcliff Dolostone; Pine Plains Formation—dolostone, oolite, shale.

€th Theresa (Galway) Formation—dolostone, sandstone, shale.

€p Potsdam Sandstone.

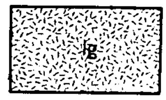
€wmd Vermont: Winooski Dolostone, Monkton Quartzite, and Dunham (Rutland) Dolostone.

€c Cheshire Quartzite.

€cd Cheshire Quartzite and Dalton Formation.

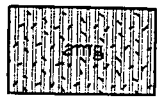
bg Biotite granitic g
granular texture.

hbg Biotite and/or ho
pyroxenic; commo
gneiss, biotite-qua
sedimentary rocks
olite with porph
prominent in no
signifies inequigra
ture. In northwest

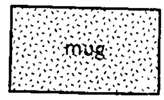


lg Leucogranitic gnei
generally subordin
with biotite, hornb
ite, disseminated
metasedimentary
plagioclase-rich va
bodies in eastern A

UNDIVIDED



amg Interlayered amphi
mangeritic, or syen



mug Interlayered meta
charnockitic, mang

MAP SYMBOLS

Observed or approximately located contact
terozoic terranes, direction of dip of
and/or foliation indicated by triangle.

Conjectural contact; includes projections
extensive Quaternary cover and many
based on reconnaissance mapping.

Hypothetical contact; projection across ur
area.

Fault; where known to be a normal fault. h
on relatively downthrown side.

Thrust or reverse fault, saw teeth on ov
block.

Shear zone or topographic lineament. Where
in detail, such lineaments are commonly fou
high angle faults with associated fault br

Antiform, showing direction of plunge (in
zoic terranes only).

Synform, showing direction of plunge (in P
zoic terranes only).

Direction of plunge of fold axis or other
element (in Proterozoic terranes only)

Boundary between areas having bedrock o
and areas of extensive Quaternary cover.

almandine

Isograd, dashed where inferred.

REFERENCE NO. 15

NUS CORPORATION AND SUBSIDIARIES — **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
02-9008-15	8/23/90	1457

DISTRIBUTION:

Lockwood Farms

BETWEEN:	OF:	PHONE:
Frank Palumbo	Frankfort Water Department	(315) 894-5116

AND:

Paul Bauer

DISCUSSION:

All residents in the area of Lockwood Farms, more specifically on Rt. 5 are on well water. The public water supply in Frankfort does not extend beyond village boundaries.

ACTION ITEMS:

NUS 067 REVISED 0685

REFERENCE NO. 16

NEW YORK

Congressional District Identification—Continued

Table 1. MUNICIPALITIES—Continued

Municipality	County	Congressional district
EAST HILLS VILLAGE	NASSAU	3
EAST RANDOLPH VILLAGE	CATTARAUGUS	34
EAST ROCHESTER VILLAGE	MONROE	30
EAST ROCKAWAY VILLAGE	NASSAU	4
EAST SYRACUSE VILLAGE	ONONDAGA	27
EAST WILLISTON VILLAGE	NASSAU	3
EDWARDS VILLAGE	ST. LAWRENCE	26
ELBA VILLAGE	GENESEE	30
ELBRIDGE VILLAGE	ONONDAGA	27
ELIZABETHTOWN VILLAGE	ESSEX	26
ELLENVILLE VILLAGE	ULSTER	28
ELLICOTTVILLE VILLAGE	CATTARAUGUS	34
ELLISBURG VILLAGE	JEFFERSON	26
ELMIRA CITY	CHEMUNG	34
ELMIRA HEIGHTS VILLAGE	CHEMUNG	34
ELMSFORD VILLAGE	WESTCHESTER	22
ENDICOTT VILLAGE	BROOME	28
ESPERANCE VILLAGE	SCHOHARIE	25
EVANS MILLS VILLAGE	JEFFERSON	26
FABIUS VILLAGE	ONONDAGA	27
FAIR HAVEN VILLAGE	CAYUGA	29
FAIRPORT VILLAGE	MONROE	30
FALCONER VILLAGE	CHAUTAUQUA	34
FARMINGDALE VILLAGE	NASSAU	4
FARNHAM VILLAGE	ERIE	31
FAYETTEVILLE VILLAGE	ONONDAGA	27
FILLMORE VILLAGE	ALLEGANY	34
FISHKILL VILLAGE	DUTCHESS	21
FLEISCHMANNS VILLAGE	DELAWARE	25
FLORAL PARK VILLAGE	NASSAU	3,5
FLORIDA VILLAGE	ORANGE	22
FLOWER HILL VILLAGE	NASSAU	3
FONDA VILLAGE	MONTGOMERY	25
FORESTVILLE VILLAGE	CHAUTAUQUA	34
FORT ANN VILLAGE	WASHINGTON	24
FORT EDWARD VILLAGE	WASHINGTON	24
FORT JOHNSON VILLAGE	MONTGOMERY	25
FORT PLAIN VILLAGE	MONTGOMERY	25
FRANKFORT VILLAGE	HERKIMER	26
FRANKLIN VILLAGE	DELAWARE	25
FRANKLINVILLE VILLAGE	CATTARAUGUS	34
FREDONIA VILLAGE	CHAUTAUQUA	34
FREEPORT VILLAGE	NASSAU	4,5
FREEVILLE VILLAGE	TOMPKINS	25
FULTON CITY	OSWEGO	29
FULTONVILLE VILLAGE	MONTGOMERY	25
GAINESVILLE VILLAGE	WYOMING	31
GALWAY VILLAGE	SARATOGA	24
GARDEN CITY VILLAGE	NASSAU	5
GENESEO VILLAGE	LIVINGSTON	31
GENEVA CITY	ONTARIO	31
	SENECA	29
GILBERTSVILLE VILLAGE	OTSEGO	25
GLEN COVE CITY	NASSAU	3
GLEN PARK VILLAGE	JEFFERSON	26
GLENS FALLS CITY	WARREN	24
GLOVERSVILLE CITY	FULTON	26
GOSHEN VILLAGE	ORANGE	22
GOUVERNEUR VILLAGE	ST. LAWRENCE	26
GOWANDA VILLAGE	CATTARAUGUS	31
	ERIE	31
GRAND VIEW-ON-HUDSON VILLAGE	ROCKLAND	22
GRANVILLE VILLAGE	WASHINGTON	24
GREAT NECK VILLAGE	NASSAU	8
GREAT NECK ESTATES VILLAGE	NASSAU	8
GREAT NECK PLAZA VILLAGE	NASSAU	3
GREENE VILLAGE	CHENANGO	25
GREEN ISLAND VILLAGE	ALBANY	23
GREENPORT VILLAGE	SUFFOLK	1
GREENWICH VILLAGE	WASHINGTON	24
GREENWOOD LAKE VILLAGE	ORANGE	22
GROTON VILLAGE	TOMPKINS	25
HAGAMAN VILLAGE	MONTGOMERY	25
HAMBURG VILLAGE	ERIE	31
HAMILTON VILLAGE	MADISON	27
HAMMOND VILLAGE	ST. LAWRENCE	26
HAMMONDSPORT VILLAGE	STEUBEN	34
HANCOCK VILLAGE	DELAWARE	28
HANNIBAL VILLAGE	OSWEGO	29
HARRIMAN VILLAGE	ORANGE	22
HARRISON VILLAGE	WESTCHESTER	20
HARRISVILLE VILLAGE	LEWIS	26
HASTINGS-ON-HUDSON VILLAGE	WESTCHESTER	22
HAVERSTRAW VILLAGE	ROCKLAND	22
HEAD OF THE HARBOR VILLAGE	SUFFOLK	1
HEMPSTEAD VILLAGE	NASSAU	5
HERKIMER VILLAGE	HERKIMER	26
HERMON VILLAGE	ST. LAWRENCE	26
HERRINGS VILLAGE	JEFFERSON	26
HEUVELTON VILLAGE	ST. LAWRENCE	26
HEWLETT BAY PARK VILLAGE	NASSAU	5
HEWLETT HARBOR VILLAGE	NASSAU	5
HEWLETT NECK VILLAGE	NASSAU	5
HIGHLAND FALLS VILLAGE	ORANGE	21
HILLBURN VILLAGE	ROCKLAND	22
HILTON VILLAGE	MONROE	30
HOBART VILLAGE	DELAWARE	25
HOLCOMB VILLAGE	ONTARIO	30
HOLLAND PATENT VILLAGE	ONEIDA	25
HOLLEY VILLAGE	ORLEANS	32
HOMER VILLAGE	CORTLAND	25
HONEOYE FALLS VILLAGE	MONROE	30
HOOSICK FALLS VILLAGE	RENSSELAER	24
HORNELL CITY	STEUBEN	34
HORSEHEADS VILLAGE	CHEMUNG	34
HUDSON CITY	COLUMBIA	24
HUDSON FALLS VILLAGE	WASHINGTON	24
HUNTER VILLAGE	GREENE	24
HUNTINGTON BAY VILLAGE	SUFFOLK	3
ILION VILLAGE	HERKIMER	26
INTERLAKEN VILLAGE	SENECA	29
IRVINGTON VILLAGE	WESTCHESTER	22
ISLAND PARK VILLAGE	NASSAU	4
ITHACA CITY	TOMPKINS	28
JAMESTOWN CITY	CHAUTAUQUA	34
JEFFERSONVILLE VILLAGE	SULLIVAN	28
JOHNSON CITY VILLAGE	BROOME	28
JOHNSTOWN CITY	FULTON	26
JORDAN VILLAGE	ONONDAGA	27
KEESEVILLE VILLAGE	CLINTON	26
	ESSEX	26
KENMORE VILLAGE	ERIE	32
KENSINGTON VILLAGE	NASSAU	8
KINDERHOOK VILLAGE	COLUMBIA	24
KINGS POINT VILLAGE	NASSAU	8
KINGSTON CITY	ULSTER	28
KIRYAS JOEL VILLAGE	ORANGE	22
LACKAWANNA CITY	ERIE	33
LACONA VILLAGE	OSWEGO	29
LAKE GEORGE VILLAGE	WARREN	24
LAKE GROVE VILLAGE	SUFFOLK	1
LAKE PLACID VILLAGE	ESSEX	26
LAKE SUCCESS VILLAGE	NASSAU	3
LAKEWOOD VILLAGE	CHAUTAUQUA	34
LANCASTER VILLAGE	ERIE	33
LANSING VILLAGE	TOMPKINS	25
LARCHMONT VILLAGE	WESTCHESTER	20
LATTINGTOWN VILLAGE	NASSAU	3
LAUREL HOLLOW VILLAGE	NASSAU	3
LAURENS VILLAGE	OTSEGO	25
LAWRENCE VILLAGE	NASSAU	5
LEICESTER VILLAGE	LIVINGSTON	31
LE ROY VILLAGE	GENESEE	30
LEWISTON VILLAGE	NIAGARA	32
LIBERTY VILLAGE	SULLIVAN	28
LIMA VILLAGE	LIVINGSTON	30
LIMESTONE VILLAGE	CATTARAUGUS	34
LINDENHURST VILLAGE	SUFFOLK	2
LISLE VILLAGE	BROOME	28
LITTLE FALLS CITY	HERKIMER	26
LITTLE VALLEY VILLAGE	CATTARAUGUS	34
LIVERPOOL VILLAGE	ONONDAGA	27
LIVONIA VILLAGE	LIVINGSTON	31
LLOYD HARBOR VILLAGE	SUFFOLK	3
LOCKPORT CITY	NIAGARA	32
LODI VILLAGE	SENECA	29
LONG BEACH CITY	NASSAU	5
LOWVILLE VILLAGE	LEWIS	26
LYNBROOK VILLAGE	NASSAU	5
LYNDONVILLE VILLAGE	ORLEANS	32

REFERENCE NO. 17

EPA ID NO.	SITE NAME / STREET / CITY / COUNTY CODE AND NAME	STATE ZIP CONG DIST.	NFA. FLAG	OPRBLE UNIT	EVENT TYPE	ACTUAL START DATE	ACTUAL COMPL DATE	CURRENT EVENT LEAD
NYD980762660 (CONTINUED)	LITTLE LEAGUE			(00)	SI2	02/01/85	02/28/85	EPA (FUND)
NYD980534671	LIVINGSTON		NFA	00	DS1		04/01/80	EPA (FUND)
	RTE 15				PA1	09/21/87	09/22/87	EPA (FUND)
	LIVONIA (V & T)	NY 14487						
	051 LIVINGSTON							
NYD981185218	LIVONIA LANDFILL			00	DS1		03/01/86	STATE(FUND)
	COMMERCIAL STREET				PA1		03/07/86	STATE(FUND)
	LIVONIA	NY 14487			SI1	03/01/86	03/07/86	STATE(FUND)
	051 LIVINGSTON							
NY9570024233	LOCKPORT AFB			00	DS1		04/01/80	EPA (FUND)
	RTE 31				PA1		03/21/86	EPA (FUND)
	LOCKPORT	NY 14094						
	063 NIAGARA							
NYD000514216	LOCKPORT CITY LF			00	DS1		03/01/79	EPA (FUND)
	OAKHURST RD				PA1		12/01/79	EPA (FUND)
	LOCKPORT	NY 14094			SI1	11/01/84	12/01/84	EPA (FUND)
	063 NIAGARA				SI2	11/01/84	12/01/84	STATE(FUND)
NYD982531295	LOCKPORT ROAD SITE		NFA	00	DS1		03/21/86	STATE(FUND)
	LOCKPORT ROAD				PA1		03/28/88	STATE(FUND)
	WHEATFIELD	NY 14150						
	029 ERIE							
NYD038642575	LOCKPORT TOWN LF			00	DS1		04/01/80	EPA (FUND)
	CANAL RD				PA1		10/15/87	STATE(FUND)
	LOCKPORT	NY 14094			PA2		12/30/87	EPA (FUND)
	063 NIAGARA							
NYD980534622	LOCKWOOD FARMS			00	DS1		10/01/79	EPA (FUND)
	HERKIMER RD				PA1		04/01/80	EPA (FUND)
	SCHUYLER	NY 13340						
	043 HERKIMER							
NYD980532360	LOMBARDY ST		NFA	00	DS1		07/25/87	EPA (FUND)
	LOMBARDY ST				PA1	08/25/87	09/02/87	EPA (FUND)
	BROOKLYN	NY 11222						
	047 KINGS							

REFERENCE NO. 18

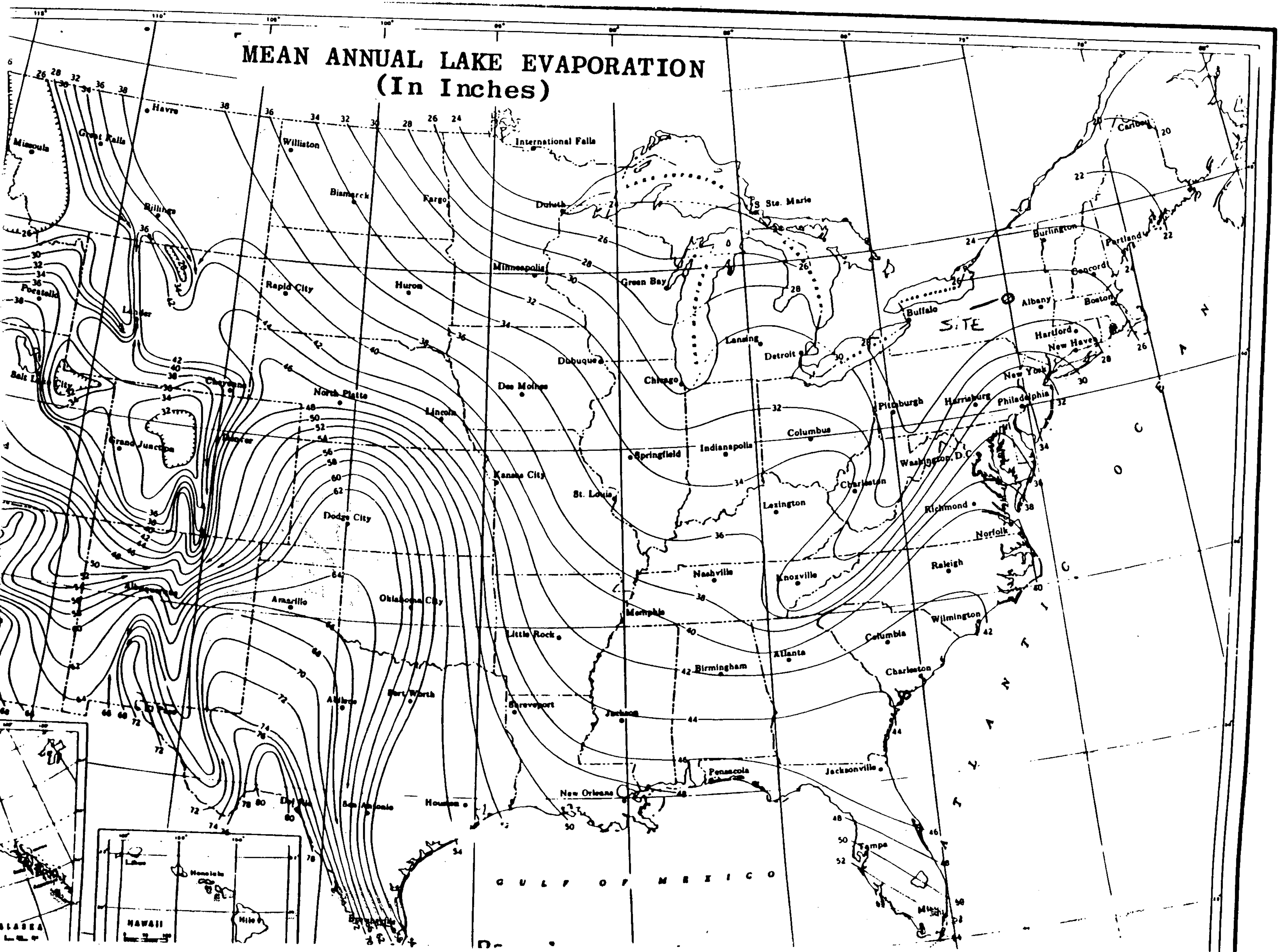
Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

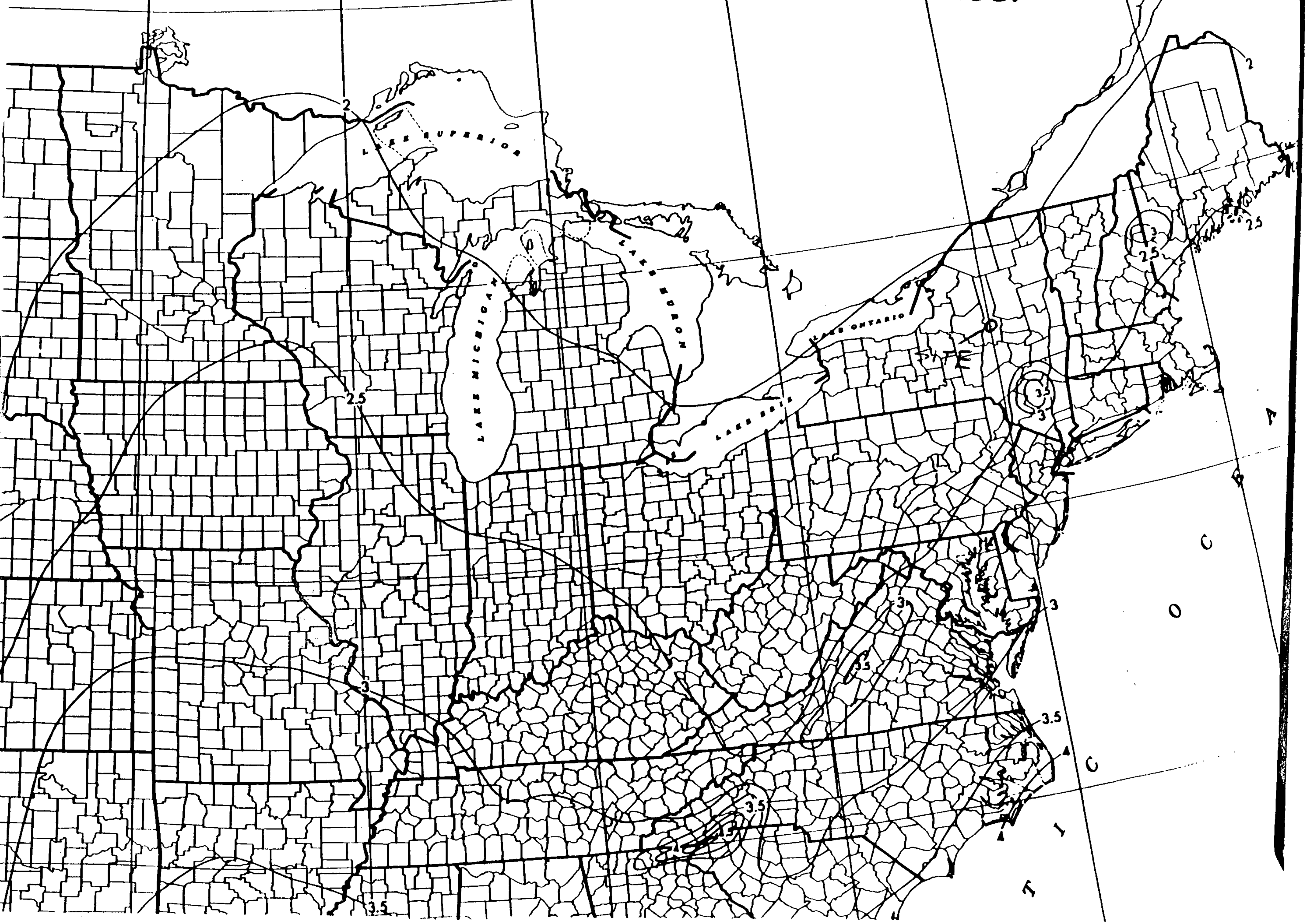
Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984


MEAN ANNUAL LAKE EVAPORATION
(In Inches)
SITE
GULF OF MEXICO
ATLANTIC OCEAN
HAWAII
ALASKA
Havre
Missoula
Great Falls
Billings
Williston
Bismarck
Fargo
International Falls
Duluth
Ste. Marie
Caribou
Burlington
Portland
Concord
Boston
Albany
Buffalo
Hartford
New Haven
New York
Philadelphia
Harrisburg
Pittsburgh
Washington, D.C.
Richmond
Norfolk
Raleigh
Wilmington
Columbia
Charleston
Jacksonville
Tampa
Miami
Pocatello
Lander
Rapid City
Huron
Minneapolis
Green Bay
Lansing
Detroit
Dubuque
Chicago
Des Moines
Salt Lake City
Cheyenne
North Platte
Lincoln
Grand Junction
Denver
Springfield
Indianapolis
Columbus
Kansas City
St. Louis
Lexington
Dodge City
Nashville
Knoxville
Amarillo
Albuquerque
Oklahoma City
Memphis
Little Rock
Atlanta
Birmingham
El Paso
Abilene
Fort Worth
Shreveport
Jackson
Pensacola
New Orleans
Houston
San Antonio
Del Rio
Brownsville
Honolulu
Hilo
Lihue

1 YEAR 24-HOUR RAINFALL (inches)



NORMAL ANNUAL TOTAL PRECIPITATION (Inches)

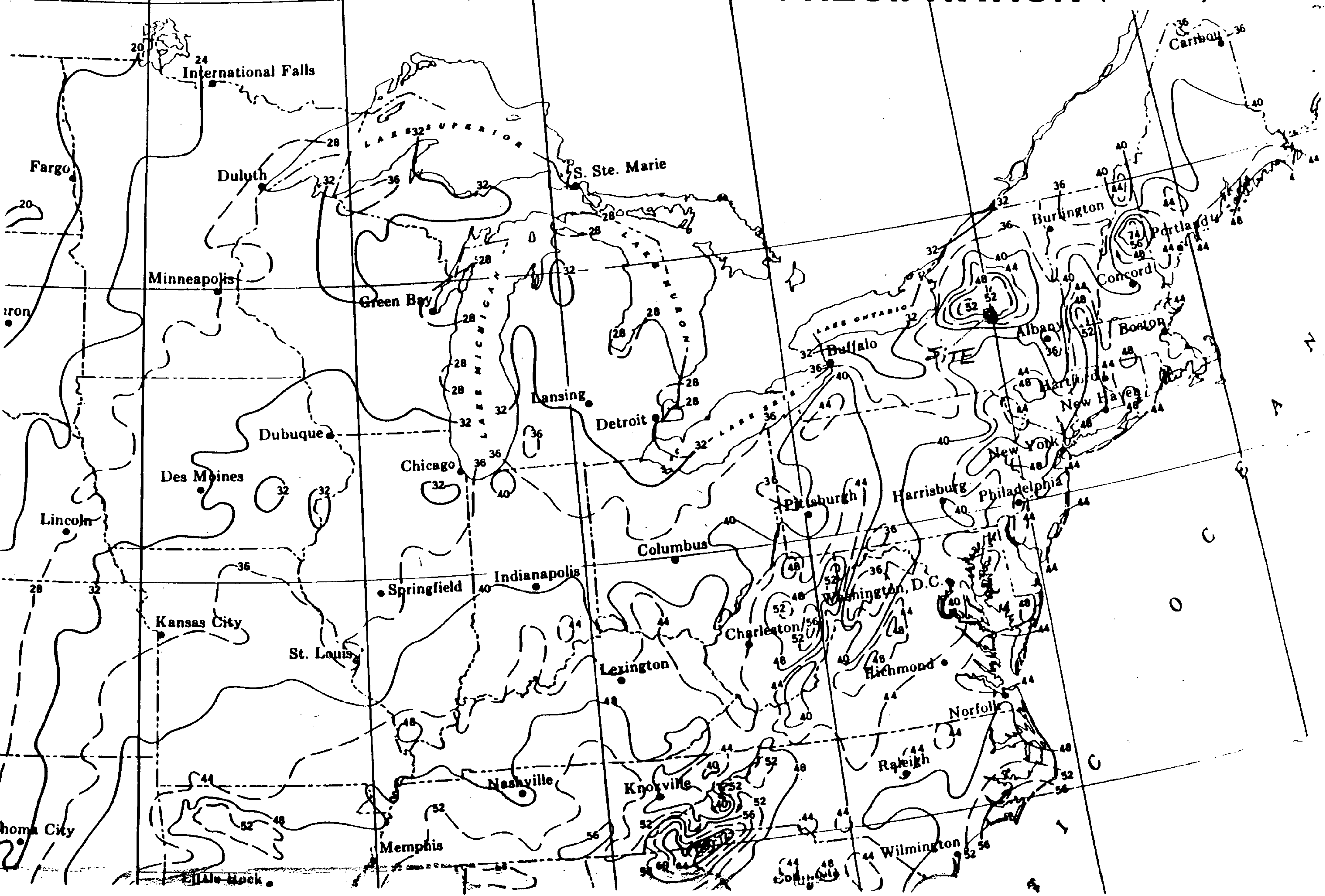


TABLE 2

PERMEABILITY OF GEOLOGIC MATERIALS*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	10^{-5} - 10^{-7} cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	10^{-3} - 10^{-5} cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

REFERENCE NO. 19

File - Universal Waste

June 27, 1979

Mr. McCarthy - Syracuse Area Office

Mr. Marsch

<u>Disposal of Transformers, Herkimer Road, (T) Schuyler, Herkimer County</u>

On June 20, 1979, I received an anonymous telephone call indicating that Universal Waste had removed a number of wet transformers from their site on Leland Ave. to a location on Herkimer Road, east of the City of Utica, just prior to the inspection conducted on April 4, 1979.

On June 21, 1979, the writer accompanied by Mr. Darrell Sweredoski and Mr. Tom Koelty of the Department of Environmental Conservation investigated the above noted allegation. We found approximately 90 transformers on the property of Mr. John Lockwood located approximately 4 miles east of the City of Utica on the south side of Herkimer Road (location map attached).

Mr. Lockwood indicated that a Universal Waste truck had broke down in front of his property a few months ago. He allowed them to unload the transformers on his property to make repairs. He indicated that a Mr. Marino, who obtains the transformers from Niagara Mohawk, had called him a number of times to make arrangements for Mr. Lockwood to salvage the transformers. Mr. Lockwood has been pumping the transformer oil out and storing it in drums.

Mr. Tom Koelty took a number of pictures and two samples for PCB's. One sample was taken from a drum of oil reportedly pumped from the transformers and the other sample was obtained directly from a transformer. We also recorded the information off a number of the transformers. Mr. Lockwood was directed not to move or disturb the transformers or drained oil. This directive was followed up by certified mail.

<u>The nearest home is approximately 300 feet away from the location of the transformers. A number of other homes were also noted in the area.</u> The slope of the land is toward the Mohawk River. The area is rural-farm land.

If you have any questions, please call.

cc: Dr. Mohanka

AM/ld

REFERENCE NO. 20

NUS CORPORATION TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-9008-15	8/30/90	1415

DISTRIBUTION:

Lockwood Farms

BETWEEN:	OF:	PHONE:
Diane Vandawalker	Herkimer County Real Property Tax	(315) 867-1153

AND: Denise O'Donoghue (NUS)

DISCUSSION:

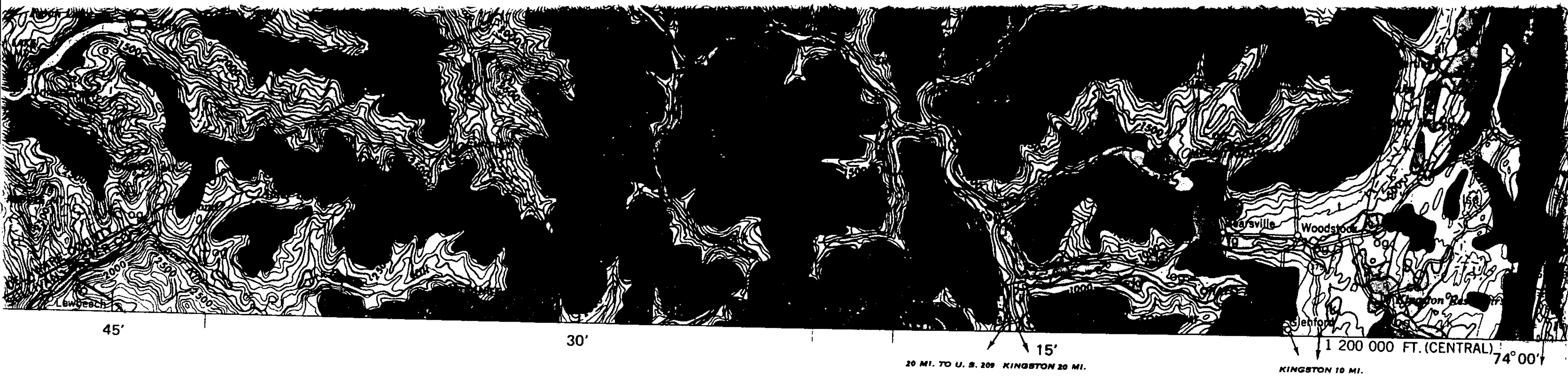
Diane stated that the lot and block for the property owned by John and Jane Lockwood in Schyler, NY was
999.150-7-51.45
RD 3
Frankfort, NY

ACTION ITEMS:

NUS 087 REVISED 0681

REFERENCE NO. 21

REFERENCE NO. 11



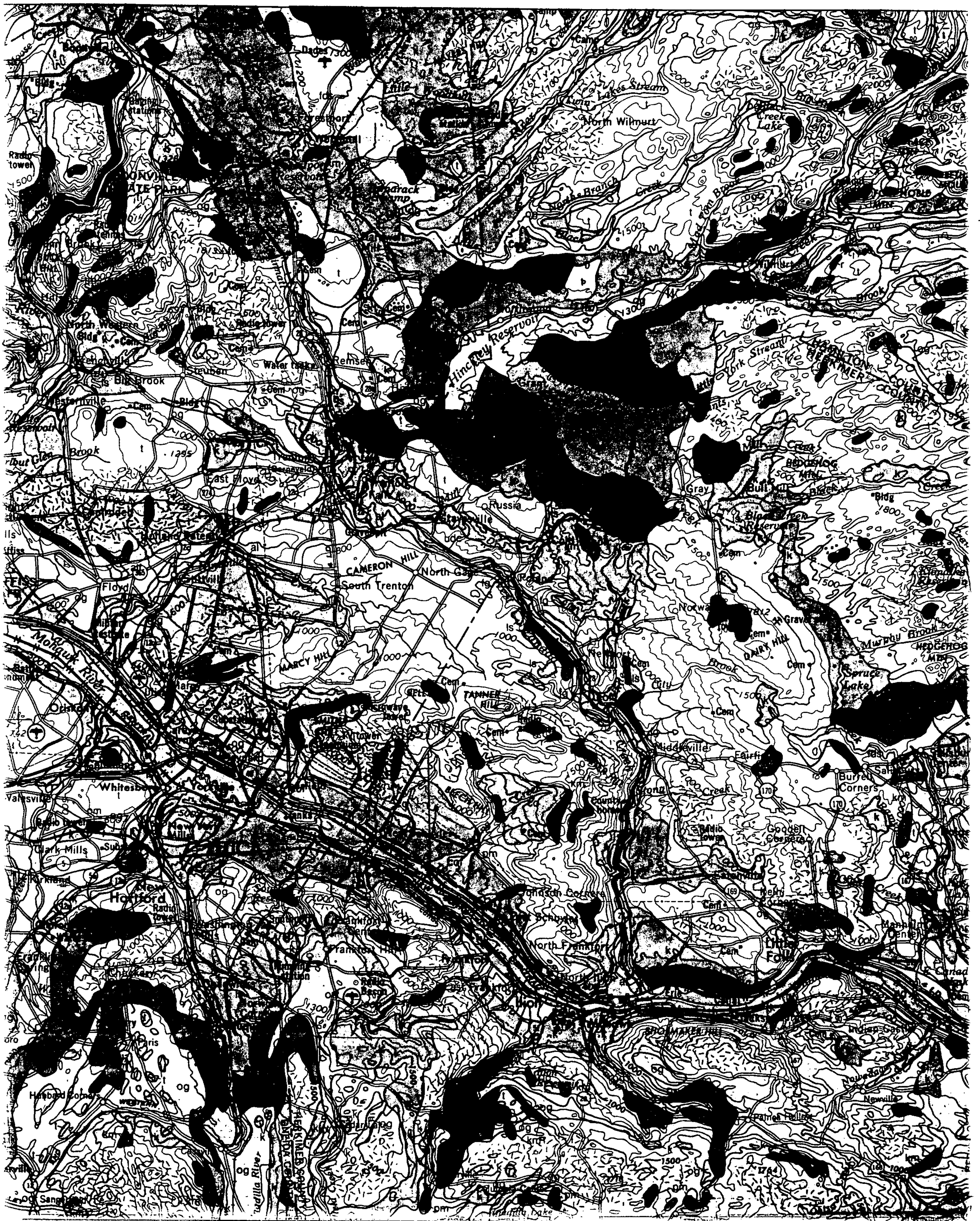
SURFICIAL GEOLOGIC MAP OF NEW YORK

HUDSON-MOHAWK SHEET

Compiled and Edited by: Donald H. Cadwell, Robert J. Dineen

1987

15' 75°00'



North Wilmurt
Hinckley Reservoir
Remsen
Steuben
North Western
Westernville
East Floyd
Russia
Gray
CAMERON HILL
North Gage
South Trenton
Floyd
MARCY HILL
Newport
DAIRY HILL
Norway
Middleville
Fairfield
Burrell Corners
Goodell Corners
Johnson Corners
Schuyler
North Frankfort
Frankfort Hill
New Hartford
Clark Mills
Whitesboro
Oriskany
Paris
Hubbard Corners
Newville
Mohawk River
Spruce Lake
Water tank
Radio tower
SHOEMAKER HILL
TANNER HILL
HERKIMER COUNTY
HAMILTON COUNTY

EXPLANATION

al — Recent deposits
Generally confined to floodplains within a valley,
oxidized, non-calcareous, fine sand to gravel,
in larger valleys may be overlain by silt,
subject to frequent flooding, thickness 1-10 meters.

alf — Alluvial fan
Fan shaped accumulations,
poorly stratified silt, sand and boulders,
at the foot of steep slopes,
generally permeable.

co — Colluvium
Mixture of sediments,
deposited by mass wasting,
thickness generally 1-5 meters.

cof

cof — Colluvial fan
Fan shaped accumulation,
mixture of sediments,
at mouths of gullies,
thickness generally 1-5 meters.

pm — Swamp deposits
Peat-muck, organic silt and sand in poorly drained areas,
unoxidized,
may be overlying marl and lake silts,
potential land instability,
thickness generally 2-20 meters.

d

d — Dunes
Fine to medium sands,
well sorted, stratified,
non-calcareous, unconsolidated,
generally wind reworked lake sediments,
permeable, well drained,
thickness variable (1-10 meters).

lb — Lacustrine beach
Generally well sorted sand and gravel,
stratified, permeable and well drained,
deposited at a lake shoreline,
generally non-calcareous,
may have wave-winnowed lag gravel,
thickness variable (1-5 meters).

ld — Lacustrine delta
Coarse to fine gravel and sand,
stratified, generally well sorted,
deposited at a lake shoreline,
thickness variable (3-15 meters).

lsc — Lacustrine silt and clay
Generally laminated silt and clay,
deposited in proglacial lakes,
generally calcareous,
potential land instability,
thickness variable (up to 100 meters).

ls

ls — Lacustrine sand
Sand deposits associated with large bodies of water,
generally a near-shore deposit or near a sand source,
well sorted, stratified,
generally quartz sand,
thickness variable (2-20 meters).

og

og — Outwash sand and gravel
Coarse to fine gravel with sand,
proglacial fluvial deposition,
well rounded and stratified,
generally finer texture away from ice border,
thickness variable (2-20 meters).

A small fraction of the carbon a
taneously with a half-life of 5570 ± 13
carbon affords a base for estimating t

The chronology of glacial event
are located on the Surficial Geologic M
are listed.

SITE	NAME TOWN	QU
1.	Pine Log Camp Lake Luzerne	L V
2.	Eagle Hill Camp Livingston	((
3.	Great Bear Swamp Westerlo	(
4.	Meadowdale Bog Voorheesville	

REFERENCE NO. 12

Water Resources of the Utica-Rome Area New York

By H. N. HALBERG, O. P. HUNT, *and* F. H. PAUSZEK

WATER RESOURCES OF INDUSTRIAL AREAS

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1499-C

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1962

UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington 25, D.C.

CONTENTS

ILLUSTRATIONS

[Plates are in pocket]

TABLES

REFERENCE NO. 22

15 (12/75)

New York State Department of Environmental Conservation

MEMORANDUM

TO: The Record
FROM: Darrell Sweredoski
SUBJECT: Transformer Dump Site, Herkimer Road, Herkimer County

DATE: June 22, 1979

On June 20, 1979, Jack Marsch from the Health Department, Utica, received a tip that Universal Waste had disposed of some transformers at the subject site just before our inspection of the Universal facility on April 4, 1979.

The following day, June 21, Tom Keelty, DEC, Utica, and Jack Marsch, Health Department, accompanied me to the site. There we found 90 to 100 transformers of various sizes and makes scattered about the area. Some were torn open, some still intact, and some were opened and still had oil in them. Mr. John Lockwood, owner of the property, was there at the time. He explained that sometime during early spring a tractor-trailer owned by Universal Waste pulled in. The trailer had broken down and the owner of the trailer or transformers wanted to unload the transformers at his property. He agreed to storing the transformers there and unloaded them. The empty tractor-trailer then left.

Mr. Lockwood stated that a Mr. Marino had purchased the transformers from Niagara Mohawk Power Corp., and they were being shipped to Universal Waste for salvaging. Mr. Lockwood had opened some of the transformers and pumped the oil from them into storage drums. I would estimate around 200 gallons of oil was stored in drums on the property, and a considerable amount of oil from the transformers was dumped on the ground. Mr. Lockwood stated that he mixed the transformer oil with fuel for his deisel tractor and intended to burn the oil for home heating.

We photographed the transformers and area and sampled oil from a transformer and a storage tank that Mr. Lockwood said contained transformer oil. We also copied the information from some of the transformers. We advised Mr. Lockwood not to distrub or remove the transformers from the area. We also sent Mr. Lockwood a registered letter stating that we did not want the transformers disturbed.

We further learned from Jim Luz, Utica, DEC office, that Mr. Marino has been involved in transformer salvage for some time.

Mr. Lockwood also stated that Mr. Marino has been persistent lately in trying to work a deal where Lockwood would strip the transformers for a price.

DMS:mjc

Universal Waste
PCB Contamination

The Record
Darrell Sweredoski
Universal Waste Inspection - April 4, 1979

July 3, 1979

On April 4, 1979 Jim Luz, Sr. Sanitary Engineer; Jack Marsch, Sr. Sanitary Engineer NYS Health Department; and I visited the Universal Waste site and met with Mr. Joseph Jiampietro, President; and Mr. Joseph Alberico, Vice-President of the Company. The reason for our visit was because of PCB capacitors which were found on the site on a previous inspection.

We question the two men on the histroy of the site and their involvement in salvaging of transformers.

They stated that the site has been occupied by Universal since 1957. Before that it was the Utica landfill. They thought that it was used as an ash dumping site for 30 - 50 years.

They stated that they did salvage transformers but all their transformers were drained prior to purchase. They acquired the transformers through a middle man from Niagara Mohawk.

They state that Universal Waste did not own the capacitors located on their site and they were not sure how the capacitors got there.

We next made a tour of the property. We were told that the area was under water a few days before. Ji, Luz showed us where the samples were taken and the capacitor pile. I would estimate that about twenty capacitors laid in a heap. Some capacitor labels indicated PCB oil used. We also saw an old barrel pile where other samples were taken. Jim Luz then showed us where the storm sewer emptied into an open ditch and where the sediment samples were taken. I made a sketch of the area and noted the distance to the Mohawk River (200 - 300').
I did not notice any transformers on the site.

A few days later the test results were received on the samples taken at Universal Waste. High PCB levels were found in the areas of the capacitors, barrel pile, and ditch sediment.

DMS:ks

15 (12/75)

To Paul Jacobi 7-11-79

2 Pages

New York State Department of Environmental Conservation

MEMORANDUM

TO: For The Record
FROM: Darrell Sweredoski
SUBJECT: Phone Conversation with Chet Wilczek, former employee of Westinghouse, Utica
DATE: ~~July 10, 1979~~

On July 9, 1979 I contacted Chet Wilczek to obtain information about the operations of the Westinghouse transformer repair shop on Wurtz Avenue, Utica. Mr. Wilczek said that he was a group leader in charge of transformer repair at the facility. He worked at the site from 1932 until the facility was moved in the mid 1960's. The facility started operations in 1929. The following information was taken from our conversation.

Mr. Wilczek said that approximately 3000 transformers were repaired anually at the facility. Most of the transformers were filled with transformer "C" type oil, but perhaps 1 % of the transformers were filled with Inerteen, a trade name for PCB. Inerteen transformers were used almost exclusively inside buildings since they were "explosion proof". Niagara Mohawk probably had few PCB transformers since their transformers are mainly outside. The regular C type oil was drained from the transformers and sold to salvage dealers for fuel oi. The Inerteen, being expensive and reusable, was drained into container, filtered to remove particles if needed, and put back into the transformer after repair work was completed. The filtering media was put into the trash and hauled away by the trash hauler, probably to the local dump, When the Inerteen transformers were cleaned, the insides of the transformers were rinsed with Inerteen and this was also filtered and reused. Mr. Wilczek said that the Inerteen had a very irritating odor and that if any of the oil was dumped down drains, the odors would persist for a period of time. He did not recall that any Inerteen had been accidentally or otherwise dumped down drains or on the property.

He also stated that the site was leased from BeeBe Contractors. Tom Keelty and I checked at the Assessor's office in City Hall and found that the property was owned during the subject period by a party named Burk.

DMS:ks

D. Swiedoski
File 4540
Universal Waste
Oneida Co.

Mr. D. Hoffman - Albany Field Office, Division of Environmental Enforcement
Mr. R. Lupe, P.E., Bureau of Hazardous Site Control, Western Investigation Section
Utica Alloys/Universal Wastes, Oneida County RJL
May 3, 1985

I have reviewed the Utica Alloys/Universal Wastes report prepared by Clayton Environmental Services, as requested by your memorandum of February 20, 1985.

As previously discussed, I have calculated a preliminary Mitre (HRS) score for this site below 28.5, despite the high levels of groundwater contamination, because there are no groundwater targets. The preliminary HRS score is estimated to be between 17.1 - 24.4, and is based on an observed release of trichloroethylene impacting off-site air resources. A higher score might be calculated if more information on surface water impacts was available.

Unfortunately, we cannot conduct a Phase II study of the site this year because our current contracts are already in progress, but could schedule the site for a Phase II study in our future contracts. However, the study conducted by Clayton Environmental Services generally meets the scope of a typical Phase II study, but needs additional clarifying data or information to better define the extent and causes of on-site contamination problems.

Although there may be some off-site sources contributing to the trichloroethylene contamination of on-site sewers, the available data indicates that the site represents a significant threat to the environment. This determination is based on the following:

1. <u>Soil Contamination</u>

   a. PCB (Aroclor 1254) is present in several locations at concentrations exceeding 50 ppm in the surficial soils. Concentrations in the most heavily contaminated areas range from 230 ppm to 36,000 ppm.

   b. Trichloroethylene is present in several locations (especially in the area of the degreaser operations) at concentrations of 66.9 ppb to 6,480 ppb in the surficial soils. Trichloroethylene exists throughout the site in the subsurface soils.

   c. Oily stains/accumulations have been observed on several areas of the site.

   d. Heavy metals are present in the surficial soils, but are within E.P. toxicity limits.

   Conclusion: A surficial cleanup of the contaminated soils is necessary.

II. <u>Groundwater Contamination</u>

a. Part 703 groundwater standards and Part 5 drinking water standards are violated in all monitoring wells for barium, iron, and manganese. In addition, violations of standards for PCB, lead and cadmium have been confirmed in some on-site monitoring wells. Contaminants found in the ground waters under the site are also present in the surficial soils.

Conclusion: Additional studies are needed to better define the extent of contamination and to determine needed remedial actions.

III. <u>Air Contamination</u>

a. Air monitoring confirms a release of trichloroethylene from the site. This is significant, even though the concentrations are within ambient air standards/guidelines.

Conclusion: Additional studies of the source of these problems and surficial cleanup of the surface soils are needed.

In closing, the Region 6 office and this office are willing to provide technical assistance in evaluating other possible contributors to the sewer contamination problem, and to determine the accuracy of conclusions in the Clayton Report. Please call me at (518) 457-0747 if you have any questions.

RL:cl

bcc: C. Goddard
W. Demick
J. Iannotti
D. Sweredoski
R. Lupe

MEAD - DEC - WATERTOWN

DS

April 10, 1979

Dr. Stasiuk - Division of Environmental Health

Mr. McCarthy - Syracuse Area Office of P.H. Services

PCB Contamination at Old Utica (C) Landfill - Oneida County
Universal Waste Inc., Empire Recycling and old Westinghouse
Transformer Repair Shop

The attached reports from Jack Marsch and Bert Mead describe a situation where ditch sediments and surface soil on the old Utica Landfill are grossly contaminated with PCBs. The highest result shows 51,200 micrograms per gram of PCB. Also, greater than 1000 micrograms per liter of trichloroethylene was measured in at the outfall of a stormwater pipe.

Mr. Marsch indicates that the closest residences or public establishments may be 2000 feet from the site and that there are no private wells in the area.

The nearest potentially affected public water supply would be Frankfort Village. Their wells, in the Mohawk River Valley, are about ten (10) miles downstream from Utica.

It is recommended that Frankfort water supply be analyzed for organic contamination.

We will continue to work with DEC to examine the other industrial sites on this property.

It is also recommended that ambient air samples be obtained near this site and tested for PCB.

JMM/bv

Attachments

cc: Mr. Mead - DEC - Watertown
Mr. Luz - DEC - Utica
Mr. Tramontano - BPWS
Mr. Marsch - SAO

REC

APR 12 1979
NYS Dept. ... Conservation
REGIONAL ENGINEER

RECEIVED

APR 11 1979

N. Y. State Department of Health
WATERTOWN DISTRICT OFFICE


NUS CORPORATION
TITLE: FOUR MILE VICINITY MAP
SITE: LOCKWOOD FARMS
SCHUYLER, N.Y.
DATE: 08/14/90
TDD: 02-9008-15
QUAD: ILION, N.Y.
FIGURE NUMBER:
SCALE: 1"= 2000'
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
N
SCHUYLER
DEERFIELD
FRANKFORT
LITCHFIELD
MOHAWK
RIVER
Dutch Hill
Little Red Sch
Rose Cem
Short Lots Sch
Budlong Cem
West Schuyler
Baker Corners
West Frankfort
Harbor
Frankfort Center
Frankfort Hill
Stewart Corners
Bennett Hill
Parker Corners
Frankfort
North Frankfort
East Frankfort
Corrado Corners
East Schuyler
Johnson Corners
Minott Corners
Osborne Hill
Oak Hill
Steuben Hill
Windfall
Carey Corners
North Ilion
Old Forge